CURTIS'S
BOTANICAL MAGAZINE,

ILLUSTRATING AND DESCRIBING

Plants of the Royal Botanic Gardens of Kew,

AND OF OTHER BOTANICAL ESTABLISHMENTS;

EDITED BY

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VOL. I.
OF THE FOURTH SERIES.
(*Or Vol. CXXXI. of the Whole Work.*)

This is an Art
That does mend Nature, change it rather, but
The Art itself is Nature.

SHAKESPEARE.

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To My Wife

HARRIET, LADY THISELTON-DYER,

WHOSE GRANDFATHER AND FATHER HAVE SUCCESSIVELY EDITED

THE "BOTANICAL MAGAZINE"

FOR THREE QUARTERS OF A CENTURY,

AND

WHOSE SKILFUL PENCIL HAS CONTRIBUTED TO IT

MANY ILLUSTRATIONS

I DEDICATE

THE FIRST VOLUME OF THE FOURTH SERIES.

W. T. T.-D.

M.S. del. J.N. Fitch lith.

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Tab. 7992.

CADALVENA SPECTABILIS.

Tropical Africa.

Scitamineæ. Tribe Zingibereæ.

Cadalvena, *Fenzl in Sitz. Akad. Wissen. Wien, Math. Nat.* vol. li. 2, p. 139.

Cadalvena spectabilis, *Fenzl, l.c.*; *Baker in Thiselton-Dyer, Fl. Trop. Afr.* vol. vii. p. 297; a *C. pistiæfolia,* Baker, foliis imbricatis basi non incrassatis differt.

Herba acaulis, stolonibus vaginatis instructa. *Folia* 4–7, rosulata, obovato-cuneata vel fere orbicularia, 2–9 poll. longa et lata, supra obscure viridia et glabra, subtus pallidiora et appresse pubescentia, marginibus integerrimis rubris minute ciliatis. *Flores* foliis coetanei, 2–4 e centro foliorum rosulæ orientes, subsessiles. *Calyx* campanulatus, membranaceus, circa 20 lin. longus, lobis 3 brevibus triangularibus. *Corolla* pallide lutea, circa 3 poll. longa, profunde lobata, lobis oblongo-lanceolatis acutis 6 lin. latis. *Staminodia* lateralia nulla. *Labellum* luteum, basi convolutum 4 poll. longum, limbo suborbiculari patente 5 poll. diam. margine undulato. *Stamen* petaloideum, luteum, 4 poll. longum, 4 lin. latum, lanceolatum; anthera paullo infra medium filamenti adnata, 4 lin. longa, loculis parallelis. *Ovarium* præcipue apice villosum; ovula numerosa; stylus filiformis; stigma flabellatum, ciliatum. *Capsula* membranacea, circa 1 poll. longa.—*Kæmpferia spectabilis,* Benth. in Benth. et Hook. Gen. Plant. vol. iii. p. 642. *Costus spectabilis,* K. Schum. in Engl. Bot. Jahrb. vol. xv. p. 422; Engl. Pflanzenr., Zingiberaceæ, p. 421. Gagnepain in Bull. Soc. Hist. Nat. Autun, vol. xv. p. 18.

This plant was originally described in 1865 as the type of a new genus, concerning the validity of which opinions have since differed. Bentham suggested that it should be united with *Kæmpferia*, while K. Schumann has placed it in *Costus*. It is, however, intermediate between these two genera, having the habit, calyx, and corolla of the former, with the stamen and staminodes as in the latter, and is, therefore, better retained as generically distinct. One other species has been referred to this genus, viz. *C. pistiæfolia*, Baker, from Angola, which differs from the present plant in having the leaves thickened and spongy at the base, but not imbricate.

C. spectabilis is widely diffused in Tropical Africa, extending from Upper Sennar and Loukoungou, on the Congo, southward to Nyasaland. A specimen from Morambala Mountain, Portuguese East Africa, collected by Sir John Kirk, is accompanied by a water-colour

drawing. Dried specimens of young plants much resemble those of *Pistia Stratiotes*, Linn. The conspicuous yellow flowers seated in the centre of the rosettes of bright green, red-edged leaves, render this plant highly decorative.

The genus was named after the traveller, Ed. de Cadalvène, author of a work entitled: *L'Egypte et La Nubie*. Paris, 1836.

Our figure was taken from a plant which flowered in a stove at Kew in July last, having been grown from tubers received in 1903 from Mr. J. McClounie, Head of the Scientific Department, Zomba, British Central Africa.

Descr.—A stemless herb, bearing stolons covered with imbricate scales. *Leaves* four to seven in a rosette, obovate-cuneate or almost orbicular, two to nine inches long and broad, upper surface dark green and glabrous, under surface paler and adpressedly pubescent, margins quite entire, red, ciliate. *Flowers* produced at the same time as the leaves, two to four subsessile in the centre of the rosette. *Calyx* campanulate, membranous, about twenty lines long; lobes three, short, triangular. *Corolla* pale yellow, about three inches long, deeply three-lobed; lobes oblong-oblanceolate, acute, six lines wide. *Lateral staminodes* none. *Lip* yellow, convolute, base four inches long; limb patent, undulate at the margin, five inches in diameter. *Stamen* petaloid, four inches long, four lines wide, lanceolate; anther adnate to the filament just below its centre, four lines long; cells parallel. *Ovary* three-celled, villous, especially at the apex; ovules many; style filiform; stigma flabellate, ciliate. *Capsule* membranous, about one inch long.—C. H. Wright.

Fig. 1, stamen and style, *natural size*; 2, stigma, *enlarged*; 3, sketch of whole plant, *much reduced*.

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lith.

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Tab. 7993.

COTYLEDON ELEGANS.

Mexico.

Crassulaceæ.

Cotyledon, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 659; *Engler & Prantl, Pflanzenfam.* vol. iii. 2, A, p. 32.

Cotyledon (§ Echeveria) **elegans**, *N. E. Brown*; species distinctissima, indumento et pedunculis 1- vel 2-floris facile distinguitur.

Suffrutex succulentus, ramosus, usque 20 poll. altus, omnino pubescens. *Folia* laxe rosulata, sessilia, spathulato-oblanceolata, acuta, $\frac{2}{3}$–$1\frac{1}{4}$ poll. longa, $\frac{1}{4}$–$\frac{1}{2}$ poll. lata, $\frac{1}{6}$ poll. crassa. *Pedunculi* infra folia oriundi, $2\frac{1}{2}$–6 poll. longi, paucifoliati, apice 1- vel 2-flori. *Sepala* inæqualia, patentissima, lanceolata, acuta. *Corolla* circiter 1 poll. longa, erecta, tubuloso-campanulata, pentagona, extra coccinea, intra flava; segmenta fere ad basin libera, lineari-oblonga, acuta, dorso carinata, basi leviter gibbosa, apice recurva. *Stamina* inclusa, pallide lutea, glabra; filamenta filiformia, glabra. *Glandulæ hypogynæ* brevissimæ, transversæ, truncatæ. *Carpella* corollæ subæquilonga, glabra.—*Oliverella elegans*, Rose in Bull. New York Bot. Gard. vol. iii. p. 2.

This most distinct and handsome species was found in August, 1901, in cultivation at Amacamaca, near the City of Mexico, by Dr. J. N. Rose, of the United States National Herbarium at Washington, and a plant was sent by him in 1903 to Kew, where it flowered in June, 1904. The specimen figured is a young plant; in the adult state it is of a much larger size. *C. elegans* is one of the very few species of *Cotyledon* that are pubescent, and this character, in conjunction with its one- or two-flowered peduncles, readily distinguish it from all others. Although the peduncles bear so few flowers, their large size and brilliant colour make it one of the most attractive species yet introduced. Like most of its Mexican congeners, this species belongs to the section *Echeveria*, and although Dr. Rose has published it under a new generic name, I can find nothing, either in habit, vegetative organs, or floral structure, whereby it can be generically separated.

Descr.—A suffruticose, succulent perennial, branching from the base upwards, one to two feet high; branches, leaves, peduncle, calyx, and outside of the corolla softly and minutely pubescent. *Branches* a quarter to a third of an inch thick. *Leaves* in small, lax, terminal rosettes,

spreading, sessile, two-thirds to one inch and a quarter long, one-third to half an inch broad, one-sixth thick, spathulate-oblanceolate, acute, flat above, convex beneath, light green, tips tinged with red. *Peduncles* arising below the rosettes of leaves, two to six inches long, bearing a few scattered, spreading leaves, which soon fall away, one- or two-flowered; pedicels half to one inch long. *Flowers* sub-erect. *Sepals* unequal, spreading, linear-lanceolate, four to six or seven lines long, about two lines broad, acute, light green. *Corolla* about an inch long, and half an inch in diameter, tubular-campanulate, five-angled, bright, clear red, or almost scarlet outside, light yellow within; segments free almost to the base, but closely overlapping, oblong, acute, recurved at the apex, slightly gibbous at the base, acutely keeled down the back. *Stamens* inserted a little above the base of the corolla, included, filaments rather stoutly filiform, not dilated at the base, pale yellow, glabrous; anthers pale yellow. *Hypogynous glands* very short, broader than long, truncate. *Carpels* about an inch long, shortly ovoid at the base, tapering into long styles, pale yellow below, greenish above, with brown stigmas.—N. E. Brown.

Fig. 1, portion of corolla and two stamens; 2, pistil and two hypogynous glands:—*all enlarged.*

M.S. del, J.N. Fitch lith.

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Tab. 7994.

PHYLLOSTACHYS NIGRA.

China and Japan.

Gramineæ. Tribe Bambuseæ.

Phyllostachys, *Sieb. & Zucc.; Munro in Trans. Linn. Soc.* vol. xxvi. (1868), p. 35. *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 1208.

Phyllostachys nigra, *Munro, l.c.* p. 38; *Rivière, Les Bambous,* pp. 255-261; *Matsumura, Useful Plants of Japan* (1895), p. 147, fig. 593. *Mitford, Bamboo Gard.* (1896), pp. 142-145, etc. *Satow, Cultiv. of Bamb. in Japan* (*Extr. Trans. As. Soc. Japan,* vol. xxvii. 1899), pp. 52-54, with plate; inter species generis panicula supradecomposita ampla distincta, *P. Faurei,* Hack., proxima, culmis haud vel minus distincte angulatis plerumque fistulosis vix specifice distincta; forma primo descripta culmis ramisque demum eleganter purpureo-nigrescentibus notabilis.—*Arundo Bambos,* Thunb. Fl. Jap. (1784), p. 54 pro parte.—*Bambusa nigra,* Lodd. Cat. of Plants, ed. 14, 1826, p. 5.

Phyllostachys nigra is not specifically distinct from *P. Henonis,* Mitf., *P. Castillonis,* Mitf., and *P. boryana,* Mitf. They are forms—mainly colour varieties—of a species which is very uniform in its flowers and inflorescences. In this respect it approaches so closely *P. Faurei,* Hack., a native of Japan, that the only tangible differences between them are in the singularly angular and perfectly solid stems of *P. Faurei.* It has been remarked by Japanese botanists that most of the bamboos of Japan flower very rarely, and "flowering periods" of thirty or sixty years have been ascribed to them.

According to Loudon (*Hort. brit.* p. 124), this Bamboo was introduced into England by C. Loddiges in 1825.* It appears in Loddiges' "Catalogue of Plants" for 1826, among the stove plants as *Bambusa nigra,* but nothing is said about the origin. Lindley, in "Penny Cyclopedia," vol. iii. (1835), p. 357, gives the neighbourhood of Canton as its home, adding that the beautiful slender stems are cut for the handles of parasols, walking-sticks, &c. It is

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* Ruprecht (l.c.) quotes "*Bambusa nigra,* Loddig., 1823," Munro and others following him. I have not seen Loddiges' Catalogue for 1823, which was the thirteenth edition, but Loudon (l.c.) has distinctly 1825 as the year of introduction.

January 1st, 1905.

impossible to trace the introduction of *P. nigra* into England to any definite collector. In 1835, a specimen of it was growing in the garden of the London Horticultural Society, and as it had stood several winters unprotected, Lindley suggested that it might be acclimatized in the south-west of England, and on the west coast of Ireland; nevertheless, it remained all but unnoticed in this country for a long time afterwards.

Although *P. nigra* has been in cultivation in France for about sixty years, and the flowering of other bamboos has generally been recorded in horticultural journals and the publications of the Société d'Acclimation of Paris, I have not been able to find a single reference to the flowering of *P. nigra* until quite recently, when it was recorded (*Gardener's Chronicle*, August, 1901, p. 154), as being in flower in the garden of the Hon. Charles Ellis, Frensham Hall, Shottermill, Haslemere. Kew had, however, received flowering specimens from the Royal Botanic Gardens, Glasnevin, in 1900. In 1902 it flowered with Lord Ventry at Burnham House, Dingle, Co. Cork, and the accompanying plate was drawn from specimens communicated by him.

Descr.—A stoloniferous shrub forming dense bushes of numerous culms. *Culms* under favourable conditions over twenty feet high; internodes as much as ten inches long, rarely more than one inch in diameter, terete apart from the flattened or shallowly grooved side facing the branches, rarely more or less angular, olive-green when young, turning purple in the second year, ultimately purple-black, covered with a white bloom below the lower node, fistulous or solid in part; branchlets very slender, graceful, much divided, thickened at the nodes. *Cataphylls* early deciduous, pale purple or violet, oblong, the lowest hairy, the upper glabrous, fimbriate at the mouth or the uppermost efimbriate, ligules short, rounded; blades linear-subulate. *Leaves* with tight glabrous sheaths, bearing more or less deciduous, fimbriæ, as much as four lines long, at the mouth, with short, truncate ligules; blades green, lanceolate, acutely acuminate, shortly attenuated from the rounded base into the short petiole, two to five inches long, five to seven lines wide, rough along both edges, pubescent near the base on the lower surface. *Panicle* copiously divided, usually large, leafy

or leafless; spathaceous sheaths at the bases of the ultimate ramifications early deciduous, oblong, narrow, six to eight lines long. *Spikelets* usually two-flowered, eight to ten lines long; glume usually one, lanceolate, acute, sometimes bearing a small blade, sparsely pubescent, about seven-nerved; valves lanceolate, subulate, acuminate, herbaceously papery, nine-nerved, densely pubescent; palea bidentate, pubescent on the sides, much shorter than the valves. *Anthers* yellow, four lines long. *Ovary* substipitate; stigmas three, as long as the style.—Otto Stapf.

Fig. 1, junction of sheath and blade of a leaf; 2, a spikelet; 3, a palea; 4, a lodicule; 5, a young stamen; 6, a pistil.

M. S. del. J. N. Fitch lith.

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Tab. 7995.

SWAINSONA maccullochiana.

North-west Australia.

Leguminosæ. Tribe Coluteæ.

Swainsona, *Salisb.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 504; *Benth. Fl. Austral.* vol. ii. p. 214; *Taubert in Engl. & Prantl. Pflanzenfam.* vol. iv. 3, B. p. 281.

Swainsona macculochiana, *F. Muell. Fragm. Phytogr. Austral.* vol. vii. p. 25; ab omnibus speciebus hactenus cognitis florum magnitudine ac pulchritudine longe distat.

Frutex erectus, sparse pubescens, usque ad 8 ped. altus. *Caulis* validus. *Folia* 8–13-juga, rhachi satis valida; foliola elliptica vel obovata, mucronata, supra glabriuscula, subtus puberula; stipulæ oblique deltoideæ, integræ vel dentatæ. *Racemus* multiflorus, longiuscule pedunculatus, bracteis subulato-setaceis; pedicelli 2 lin. longi, apice bracteolati. *Calycis dentes* setaceo-acuminati, tubo paullo breviores, postici deltoidei, laterales semilanceolati, anticus anguste triangularis. *Corolla* rubro-purpurea; vexillum ovato-orbiculare, emarginatum, infra medium reflexum, carinam leviter curvatam obtusam paullo superans; alæ carina vix breviores, oblongæ, rotundatæ, basi auriculatæ, ungue curvato. *Ovarium* longiuscule stipitatum, sericeo-pubescens; stylus pilorum fasciculo terminali carens. *Legumen* breviter stipitatum, sutura ventrali intrusa biloculare, molliter pubescens, stylo incurvo persistente coronatum; semina rugosa.

The small tribe *Coluteæ* contains seven or eight rather closely allied genera, three of which, *Lessertia*, *Sphærophysa*, and *Swainsona* might well be united. *Sphærophysa* scarcely differs from *Swainsona* except in the more globose pod, and Taubert has accordingly reduced it to the latter genus. The separation of the S. African *Lessertia* from *Swainsona*, which includes about forty Australian species, and one from N. Zealand, is hardly more justifiable. *Swainsona* has a more or less two-celled pod by intrusion of the ventral suture, and the style usually bearded along the inner side; *Lessertia* a one-celled pod, and a style which usually is not bearded along the inner side; but *Swainsona laxa* has the style of a *Lessertia*, and *Lessertia physodes* that of a *Swainsona*.

Taubert, though keeping the two genera distinct, admits that they will probably be united by some future monographer.

Swainsona procumbens, *S. phacoides*, *S. oroboides* and

other species are reputed valuable fodder plants for sheep when mixed with other herbage, but one or two species of *Swainsona*, including *S. galegifolia*, are poisonous to stock, and produce symptoms like those caused by the N. American "loco" weeds. Several species have become well-known greenhouse plants, and the following have been figured in this magazine :—*S. coronillæfolia* (t. 1725), *S. greyana* (t. 4416), and *S. occidentalis* (t. 5490).

Swainsona maccullochiana is by far the finest species from a horticultural standpoint. Mueller states that its stem is simple in the lower part and that it grows in the form of a small tree. It was first introduced into English gardens by Messrs. H. Low & Co. of Enfield, who exhibited it in flower at the Temple Show in 1901, when it was awarded a First Class Certificate by the Royal Horticultural Society. Our plate was prepared from a plant which was raised at Kew from seeds sent by Mr. G. F. Berthoud, Waroona, West Australia, and flowered in July, 1904.

Descr.—An erect, sparsely pubescent shrub, eight feet high or less. *Stem* stout at the base. *Leaves* with eight to thirteen pairs of leaflets; leaflets elliptic or obovate, mucronate, nearly glabrous above, puberulous below. *Raceme* many-flowered, with subulate-setaceous bracts. *Pedicels* two lines long, with two setaceous bractlets at their apex. *Calyx-teeth* acuminate, rather shorter than the tube, the two uppermost deltoid, the lower ones narrower. *Corolla* reddish-purple; standard ovate-orbicular, emarginate, reflexed, slightly exceeding the obtuse keel; wings rather shorter than the keel, oblong, rounded, auricled at the base. *Ovary* stipitate, silky-pubescent; style without a terminal tuft of hairs. *Pod* shortly stipitate, two-celled by intrusion of the ventral suture, softly pubescent. *Seeds* wrinkled.—T. A. Sprague.

Fig. 1, calyx laid open and stamens; 2, standard; 3, wing; 4, keel; 5, pistil; 6, pods :—*all slightly enlarged.*

M.S. del, J.N. Fitch lith.

Vincent Brooks, Day & Son Lith.

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Tab. 7996.

VANILLA Humblotii.

Madagascar.

Orchidaceæ. Tribe Neottieæ.

Vanilla, Swartz; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 590. *Pfitzer in Engl. & Prantl. Pflanzenfam.* vol. ii. 6, p. 108.

Vanilla (§ Aphyllæ) **Humblotii**, *Reichb. f. in Gard. Chron.* 1885, vol. i. p. 726; *Rolfe in Journ. Linn. Soc.* vol. xxxii. p 476; *Cogn. et Gooss. Dict. Ic. des Orch.*, Vanilla, t. 1; inter species aphyllas labelli disco valde villoso distincta.

Caules alte scandentes, teretes, crasso-carnosi, verrucosi, glaucescentes, maculati; internodia 3½–4 poll. longa, 5–6 lin. lata. *Squamæ* ovatæ, acutæ, parvæ. *Racemi* laterales, 6 poll. longi, circa 6-flori, rhachi cauli similis. *Bracteæ* ovato-oblongæ, obtusæ v. subacutæ, 6–10 lin. longæ, carneo-brunneæ. *Flores* aperti, speciosi, lutei, labelli discus brunneo-maculatus, fauces pilis sanguineis instructæ. *Pedicelli* 2–2¼ poll. longi. *Sepala* elliptico-oblonga, subobtusa, 2½–2¾ poll. longa, 10–11 lin. lata, lateralia subfalcata. *Petala* elliptica, subobtusa, 2½–2¾ poll. longa, 1¼ poll. lata. *Labellum* integrum, apiculatum, undulatum, 2¼–2½ poll. longum, marginibus prope basin convolutis et columnæ adnatis; tubus latus, 6–7 lin. longus; discus pilosus, pilis inferioribus retrorsis, superioribus in lineas divergentes extensis. *Columna* clavata, arcuata, 10 lin. longa; rostellum quadratum, 1 lin. longum.—*V. Phalænopsis*, Gard. World, 1904, p. 481, non Reichb. f.

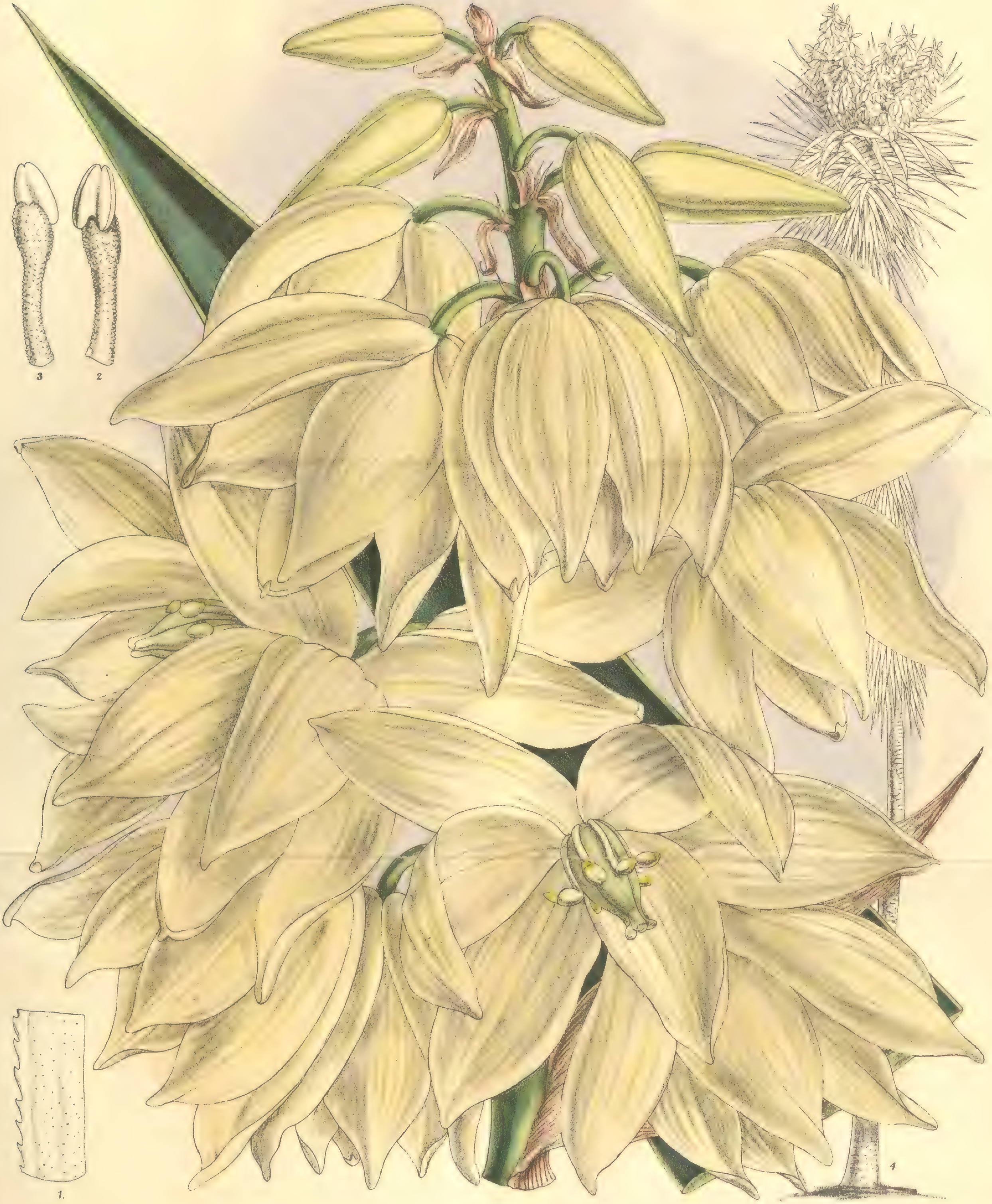
The only Vanilla hitherto depicted in this Magazine is the Vanilla of commerce, *V. planifolia*, Andr. (t. 7167). This species is one of the very few Orchids which are of economic importance. The subject of the present plate is a very different species, belonging to the section *Aphyllæ*, a remarkable group of about a dozen species, found in each of the three great tropical areas. The African species of this group are four in number, namely: *V. Roscheri*, Reichb. f., from Zanzibar; *V. madagascariensis*, Rolfe, from Madagascar; *V. Phalænopsis*, Reichb. f., from Seychelles, and the present one, *V. Humblotii*, Reichb. f. The last was described by Reichenbach, in 1885, from dried specimens collected in the Great Comoro Islands by Mr. Leon Humblot. Nothing further was known about it until last June, when a plant supposed to be *V. Phalænopsis*, Reichb. f., flowered in the collection of Sir Trevor Lawrence, Bart., at Burford, Dorking, and the inflorescence

was sent to Kew for figuring. Sir Trevor's plant was sent from Madagascar in June, 1900, by Mr. Hamelin. The stem sent was wired on to a teak trellis, which was fixed into a large pot filled with sphagnum moss, and placed in a hothouse. It soon began to grow vigorously, and a year later had reached the top of the trellis, after which it was trained horizontally along the roof. When it flowered, in June last, it had reached a length of ten or twelve feet, and the inflorescence was produced about four feet from the top of the stem.

V. Phalænopsis, with which *V. Humblotii* was confused, has dark green, uniformly coloured stems, and smaller flowers, which have cream-white sepals and petals, and an orange-yellow lip, paler on the margin. It is figured in *Flore des Serres*, t. 1769–1770. There is a small plant in the Kew collection, but it has not yet flowered.

Descr.—A tall, leafless climber. *Stems* terete, fleshy, glaucous green, covered with numerous dark green warts; internodes three to four inches long, by about six lines broad; stouter at the base. *Squamæ* ovate, acute, about four lines long. *Inflorescence* lateral, six inches long, like the stem in colour and markings, but with fewer warts. *Bracts* oblong, subacute, or obtuse, somewhat concave, six to ten lines long. *Pedicels* about two inches long. *Flowers* about five inches across, bright yellow, with numerous brown markings on the lip, and some rosy crimson hairs in the throat. *Sepals* elliptic-oblong, sub-apiculate, two and a half to three inches long, ten to eleven lines broad; lateral somewhat falcate. *Petals* similar, but broader. *Lip* entire, apiculate, undulate, about two inches and a half long, convolute at the base, and adnate to the sides of the column, forming a broad tube, about half an inch long; disc pilose, rosy crimson, lower hairs retrorse, extending upwards in two broad lines, with, on either side, a number of short, radiating brown lines. *Column* clavate, slightly arcuate, ten lines long; rostellum quadrate, one line long.—R. A. Rolfe.

Fig. 1, column; 2 and 3, anther case seen from front and back:—*all magnified*.



M.S. del. J.N. Fitch lith.

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Tab. 7997.

YUCCA guatemalensis.

Central America.

Liliaceæ. Tribe Dracæneæ.

Yucca, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 778; *Baker in Journ. Linn. Soc.* vol. xviii. p. 219; *et in Gard. Chron.* 1870, *passim.*

Y. (§ Sarcoyucca) **guatemalensis,** *Baker in Ref. Bot.* vol. v. t. 313; *Engelmann, Coll. Bot. Works,* p. 289; *Trelease, Missouri Bot. Gard. Ann. Rep.* 1893, p. 184, tt. 1, 2, 19, inter species hujus sectionis foliis minute denticulatis non filiferis distincta.

Arbor circiter 40-pedalis. *Truncus* ad terram circiter 6 ped. ambitu, sursum gradatim angustatus, ad pedem supra solum 5 ped. ad 6 pedes supra solum 2 ped. ambitu, prope apicem tantum dense pauciramosus. *Folia* conferta, diu persistentia, maxima circiter 4-pedalia, basi semiamplexicaulia, 5 poll. lata, paullo supra basin 3 poll. lata, 6 poll. supra basin 2¼ poll. lata, 2¼ ped. supra basin 4 poll. lata, paullo supra insertionem abrupte recurva, alte concavo-convexa, margine per totam longitudinem minute dentata, apice vix pungentia. *Paniculæ* dense ramosæ, fere sessiles, 3–4 ped. longæ; bracteæ quam pedicelli breviores; pedicelli 1–2 poll. longi, graciliusculi. *Flores* albi vel pallide luteo-virides, circiter 3-poll. diametro. *Perianthium* companulatum; segmenta lanceolata, 3 exteriora paullo angustiora, 1¾–2 poll. longa, omnia obtusa, apice inflexa. *Stamina* quam pistillum breviora; filamenta clavata, puberula vel minute papillosa. *Ovarium* glabrum; styli brevissimi. *Fructus* baccatus mihi ignotus.—*Y. Roezlii*, et *Y. Ghiesbreghtii*, Hort., *Dracæna Ehrenbergii*, *D. Lennei*, *D. yuccoides*, et *D. ensifolia*, Hort., fide Baker in Journ. Linn. Soc. Bot. vol. xviii. p. 222.

The above description is entirely drawn up from the specimen figured, which has been growing in the Temperate House, Kew, at least twenty-five years, and is now the largest of which the dimensions are on record. It is probably the same one that is figured in the "Refugium Botanicum," and, if so, it was previously in the Succulent House. This species is one of the handsomest of the genus, but it is not quite hardy. The date of its introduction into this country is uncertain, yet it must have been long before 1873, when it was first figured, and then also from a plant that flowered at Kew. At that time it had a trunk from five to six feet high.

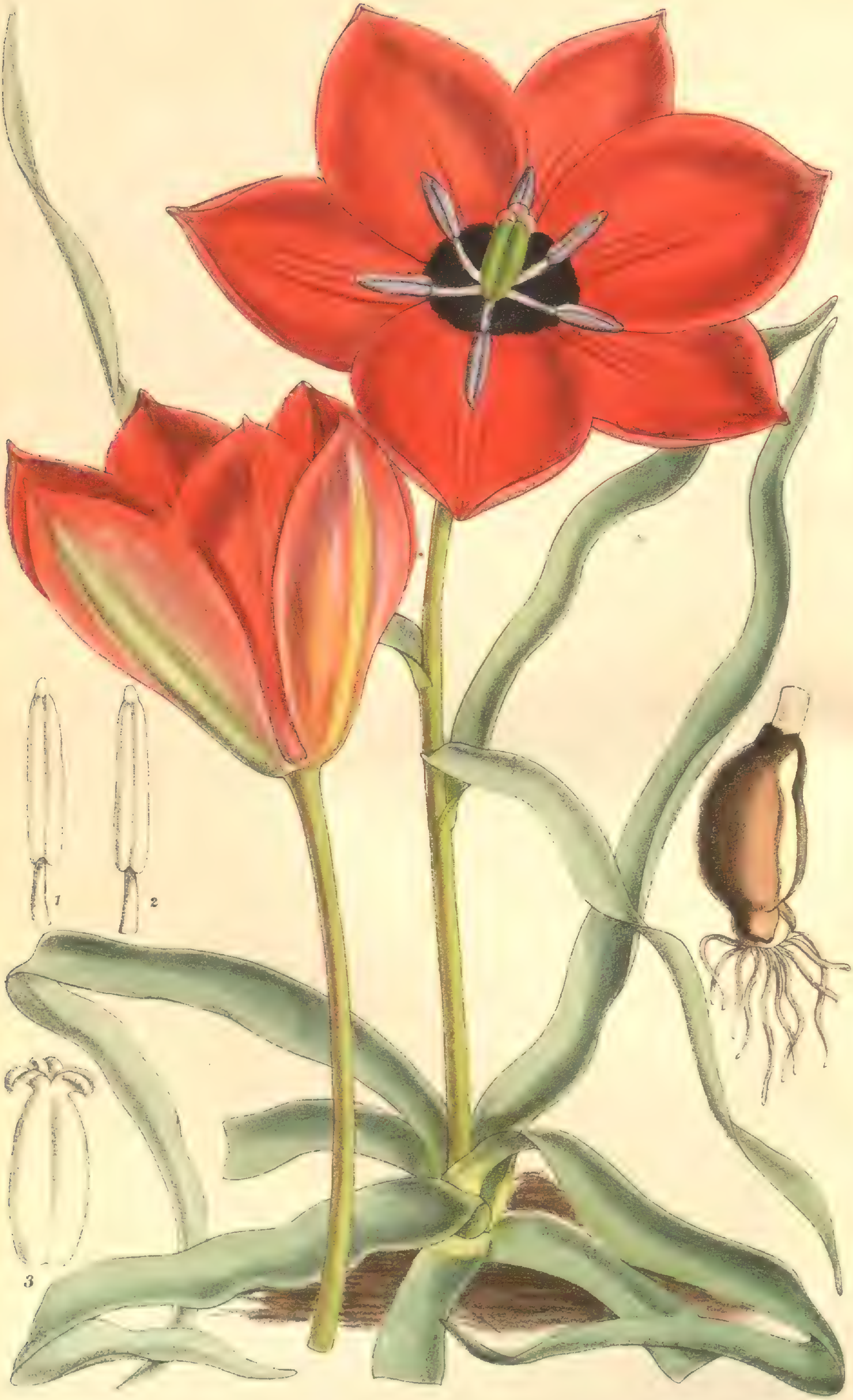
Dr. W. Trelease, Director of the Missouri Botanic Garden, who has more fully than any other botanist described and illustrated the genus *Yucca* and its allies, identifies *Y. guatemalensis*, Baker, with a plant included by Regel (*Gartenfl.* vol. viii. 1859, p. 35) under *Y. aloifolia.*

February 1st, 1905.

Regel casually mentions that it was also known in gardens under the name of *Y. elephantipes*, on account of the stem being thickened at the base. Consequent on this identification, Trelease (*Missouri Bot. Gard. Ann. Rep.* 1902, p. 94, tt. 51, 82, & 84, f. 7) adopts the last name for the species, a course which we do not feel justified in following. He may be right, but even if he is, it seems undesirable to take up a name that has no more claim than some of the other synonyms cited above. As to the swollen base of the stem, that may be an inconstant character. The figure in the "Refugium Botanicum" represents a perfectly cylindrical stem, and the tree here described has a tapering stem, without any bulging at the base. On the other hand, a *Yucca* growing in the Cambridge Botanic Garden figured in the "Gardeners' Chronicle" (series 3, vol. xxiii. 1895, p. 524, f. 93) as *Y. guatemalensis* had a stem with a swollen base. At our request, Mr. Lynch has sent us a leaf of the Cambridge plant, which has all the characteristics of *Y. guatemalensis*.

Descr.—A tree about forty feet high. *Trunk* not swollen at the base, about six feet in girth close to the ground; about five feet at one foot from the ground, and about two feet at six feet from the ground, densely branched at the very top only. *Leaves* crowded, persistent long after withering, largest about four feet long, stem-clasping base five inches broad, narrowed immediately above the attachment, two inches and a quarter broad at six inches from the base, about four inches broad at two feet and a quarter from the base, deeply concavo-convex, margin very obscurely toothed throughout, tip scarcely spiny. *Panicle* densely branched, almost sessile, three to four feet long; bracts shorter than the pedicels. *Flowers* white, or slightly tinged with yellow, about three inches across. *Perianth* campanulate; segments lanceolate, about two inches long, rather obtuse, three outer somewhat narrower than the inner. *Stamens* shorter than the pistil; filaments club-shaped, puberulous. *Ovary* glabrous; style very short. *Fruit* a berry, not seen by us.—W. Botting Hemsley.

Fig. 1, portion of the edge of leaf; 2 and 3, stamens:—*all enlarged*; 4, whole plant: *about one-fiftieth of the natural size.*



M. S. del, J. N. Fitch lith.

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Tab. 7998.

TULIPA linifolia.

Turkestan.

Liliaceæ. Tribe Tulipeæ.

Tulipa, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 818; *Baker in Journ. Linn. Soc.* vol. xiv. p. 275.

Tulipa linifolia, *Regel in Acta Horti Petrop.* vol. viii. p. 648, t. 5, ff. 1 et 2; *Gartenfl.* 1886, p. 622, t. 1235; species ex affinitate *T. montanæ*, Lindl., perianthii segmentis æqualibus apice non attenuatis differt.

Bulbus ovoideus, 6–9 lin. diam., extus nigrescens, tunicis apice intus hirsuto-barbatis. *Caulis* tenuis, 2–10 poll. altus, plus minusve flexuosus. *Folia* circa 6, ad medium caulis affixa, primum congesta, demum sparsa, linearia vel infima lineari-lanceolata, flores demum superantia, glabra vel sparse ciliata, 3–5 poll. longa, 2–4 lin. lata. *Pedunculus* glaber, uniflorus. *Perianthii segmenta* inter se æqualia, obovata vel ovato-lanceolata, subito breviterque acuminata, coccinea, basi macula atro-purpurea ornata. *Stamina* perianthio dimidio breviora; filamenta e basi dilatata linearia, glabra; antheræ oblongæ, purpureæ, filamentis paullo breviores. *Ovarium* oblongum, trigonum; stylus brevis, conicus; stigma capitatum, ovario paullo latius. *Capsula* ovoidea, trigona, stylo persistenti apiculata.

This is one of the species of *Tulipa* from Turkestan alluded to under t. 7991. It was discovered by Albert Regel at Darwas, in Eastern Bokhara, at from 3,000 to 6,000 ft. elevation, and has for the past twelve years been in cultivation at Kew, where it flowers annually in May, our figure being made last spring. The bulbs were probably originally received from the late Dr. E. Regel, Director of the Botanic Gardens, St. Petersburg. A comparison of the wild with the cultivated specimen shows that while the latter remains dwarf, its stem has increased in thickness and the leaves in width. In the wild state the stem is almost more slender than in any other species of the genus, and more or less flexuous. The leaves are usually borne above the middle of the stem. The dwarf habit and brilliant crimson flowers render this plant attractive for cultural purposes.

T. linifolia cannot be placed in any of the sections of the genus proposed in Mr. Baker's monograph in the Journal of the Linnean Society, vol. xiv. (1875) p. 276, but is intermediate between the *Eriobulbi* and *Sylvestres*.

February 1st, 1905.

Its nearest ally is *T. Maximowiczii*, Regel (*Gartenflora*, 1889, p. 505, t. 1307, fig. 1), also a native of Eastern Bokhara, which has narrow leaves, but can be readily distinguished by its acuminate perianth-segments, the outer being much broader than the inner.

Descr.—A dwarf plant. *Bulb* ovoid, six to nine lines in diameter, tunics blackish outside, bearded inside at the apex with brownish hairs. *Stem* slender, two to ten inches high, more or less flexuous. *Leaves* about six near the middle of the stem, at first close together, finally separated by the lengthening of the internodes, linear, or the lowest linear-lanceolate, overtopping the flowers, glabrous or sparingly ciliate, three to five inches long, two to four lines broad. *Peduncle* glabrous, one-flowered. *Perianth-segments* uniform, obovate or ovate-lanceolate, abruptly and shortly acuminate, crimson, with a black-purple spot inside the base. *Stamens* about half as long as the perianth, purple; filaments linear from a dilated base, glabrous; anthers oblong, rather shorter than the filaments. *Ovary* oblong, trigonous; style short, conical; stigma capitate, a little wider than the ovary. *Capsule* ovoid, trigonous, beaked by the persistent style.—C. H. Wright.

Figs. 1 and 2, anthers; 3, pistil: *all enlarged.*

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Tab. 7999.

ANGELONIA integerrima.

Brazil and Paraguay.

Scrophulariaceæ. Tribe Hemimerideæ.

Angelonia, *Humb. et Bonpl.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 930.

Angelonia (§ Crassifoliæ) **integerrima**, *Spreng. Syst.* vol. iv. *Cur. Post.* p. 235; *Cham. et Schlecht. in Linnæa*, vol. ii. p. 592; *Schmidt in Mart. Fl. Bras.* vol. viii. pars 1, p. 243, t. 39, fig. 1; inter species hujus sectionis planta glaberrima foliis integerrimis vel obscure paucidentatis distinctissima.

Herba vel suffrutex 1½–3 ped. altus, glaberrimus. *Caules* erecti, stricti, robusti, simplices vel parce ramosi, plus minusve conspicue quadrangulares; internodia 1–2 poll. longa. *Folia* opposita et decussata, subopposita vel subverticillata, sessilia vel rarius brevissime petiolata, paulum coriacea, lanceolata vel oblongo-lanceolata, 1½–4 poll. longa, 4–9 lin. lata, acuta vel obtusiuscula, basi angustata, integerrima, margine leviter revoluta, vel obscure paucidentata, supra costa impressa infra elevata. *Racemi* terminales, 4–6 poll. rare usque ad 9 poll. longi, laxiusculi, bracteati, floribus nutantibus; pedicelli solitarii, geminati vel interdum fasciculati, graciles, ascendentes, 3½–6 lin. longi, sæpe bracteas superantes. *Calyx* 5-partitus; segmenta ovata, 1½–2 lin. longa, 1¼ lin. lata, acuta, margine membranacea, obsolete ciliolata. *Corolla* ampla, 7–8 lin. in diam., pallide cærulea vel lilacina, purpureo-maculata, antice saccata, sacco lato breviter 2-lobato; limbi lobi patentes, breves, rotundati, faucis appendice breviter obtusa lateraliter compressa. *Stamina* 4, didynama, inclusa; filamenta crassiuscula, minute glanduloso-pubescentia; antherarum liberarum loculi divaricati. *Stylus* inclusus, leviter curvatus, minute glanduloso-pubescens, sursum attenuatus, inconspicue bifidus. *Capsula* ovoidea, 6–8 lin. longa, basi 4–4½ lin. lata, acuta, profunde 2-valvata. *Semina* numerosa, parva, obovoidea, tegumento laxe reticulato.

Angelonia comprises twenty-six species, nearly all of which are Brazilian. *A. angustifolia*, Benth., is found in Mexico, Costa Rica, Jamaica, and Cuba, and *A. salicariæfolia*, Humb. et Bonpl., inhabits Venezuela, Colombia, British Guiana, and some of the West Indian islands, while *A. hassleriana*, Chodat, is at present known only from Paraguay. *A. integerrima* has been collected by several travellers in the States of São Paulo and Rio Grande do Sul, Southern Brazil, and by Balansa and Hassler in Paraguay.

Several species of *Angelonia*, mostly pretty, free-flowering herbs or undershrubs, have appeared from time to time in European gardens, apparently, in most cases, to disappear again very quickly. Three have been figured in this magazine: *A. salicariæfolia* (t. 2478), *A. Gardneri*

(t. 3754), and *A. cornigera* (t. 3848), each of which is easily distinguished from *A. integerrima* by being pubescent, and by having more or less distinctly toothed leaves. Perhaps the finest species of all, judging from dried specimens, is *A. tomentosa*, Moric., a densely pubescent plant having large flowers in racemes nearly a foot long. It does not appear to be common, as the Kew Herbarium contains only two specimens. Its cultivation has evidently never been attempted.

The plant which furnished the specimen here figured was purchased from a continental nursery in 1903, and it flowered during the autumn in a greenhouse.

Descr.—*Herb* or undershrub one and a half to three feet high, glabrous. *Stems* erect, straight, robust, simple, or sparingly branched, more or less conspicuously quadrangular; internodes one to two inches long. *Leaves* opposite and decussate, subopposite or subverticillate, sessile or very shortly stalked, leathery, lanceolate, or oblong-lanceolate, one and a half to four inches long, four to nine lines broad, scarcely acute, narrowed towards the base, entire or obscurely few-toothed, margin revolute, at least when dry, midrib impressed above, elevated below. *Racemes* terminal, four to six inches, rarely up to nine inches long, rather lax, bracteate. Flowers nodding; pedicels solitary, geminate, or sometimes fascicled, slender, three and a half to six lines long. *Calyx* five-partite; segments ovate, one and a half to two lines long, about one line and a quarter broad, acute, membranous on the margin, obscurely ciliolate. *Corolla* about seven lines across, pale mauve or lilac, spotted with purple, broadly saccate in front; lobes of the limb short, rounded, spreading; appendage of the throat short, obtuse, laterally compressed. *Stamens* four, included; filaments rather thick, minutely glandular-pubescent; anthers free; cells divaricate. *Style* included, slightly curved, minutely glandular-pubescent, narrowed above. *Capsule* ovoid, six to eight lines long, four to four and a half lines broad at the base, acute, deeply two-valved. *Seeds* numerous, small, obovoid; integument loosely reticulate.—S. A. Skan.

Fig. 1, calyx and pistil after the fall of the corolla; 2, vertical section of the corolla showing the position of the stamens; 3, part of lower lip of the corolla showing appendage and sac; 4, stamens; 5, pistil, the calyx removed, showing disk:—*all enlarged*.

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Tab. 8000.

BULBOPHYLLUM crenulatum.

Madagascar.

Orchidaceæ. Tribe Epidendreæ.

Bulbophyllum, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 501; *Pfitzer in Engl. & Prantl Pflanzenf.* vol. ii. 6, p. 178.

B. crenulatum, *Rolfe (sp. nov.)*; inter species madagascarienses inflorescentiis clavatis sepalis lateralibus crenulatis et ovario hexaptero alis serrulatis distincta.

Herba epiphytica rhizomate valido lignoso. *Pseudobulbi* late oblongi, tetragoni, diphylli, 1¼–1½ poll. longi, 1 poll. lati. *Folia* elliptico-oblonga, obtusa, subsessilia, 2–3 poll longa, 9 lin. lata, coriacea. *Scapi* suberecti, crassiusculi, 5–6 poll. longi, vaginis ovato-oblongis apiculatis basi tubulosis vestiti; racemi penduli, 2 poll. longi, densiflori; rhachis clavata, crassiuscula, sordide purpurea. *Bracteæ* transverse oblongæ, obtusæ, 1 lin. longæ, purpureæ. *Flores* 2 lin. longi. *Ovarium* latum, hexangulum, alis serrulatis. *Sepalum* posticum ovatum, obtusum, trinervium; lateralia in corpus latum rotundum bilobum margine crenulatum connata, flava, rubro-venosa. *Petala* lineari-oblonga, obtusa, 1-nervia. *Labellum* in cavo sepalorum lateralium inclusum, ovatum, obtusum, carnosum, margine paullo recurvum; discus callo obscure quinquelobo instructus. *Columna* latissima, alis tridenticulatis, pede basi lato sursum attenuato.

Bulbophyllum is a large and remarkably polymorphic genus, extending throughout the tropics where the climatic conditions are favourable. No less than eighteen species have been figured in the present work, the remarkable *B. Weddelii*, Reichb. f., a native of Brazil, as recently as last June (t. 7958), when some particulars of the characters and geographical distribution of the genus were given. The present species is a very different plant, a native of Madagascar, whence it was sent to the late Hermann Wendland, of Herrenhausen, Hanover, by the unfortunate Johannes Braun, who died at Antananarivo some years ago. It is one of a number of species discovered by him. The plant figured flowered in the Royal Botanic Garden, Glasnevin, in January, 1904, and Mr. F. W. Moore, A.L.S., furnished particulars of its origin.

Its exact affinity is somewhat doubtful. In general appearance it resembles the species of the *B. clavatum* group, which as at present understood is represented in the Mascarene islands, the Philippines, and Tropical

America, but the inflorescence and flowers are more like those of the Indian *B. cylindraceum*, Lindl., in which the bulbs are practically absent, monophyllous, and the leaves long petioled. In such a diversified genus it is not always certain which set of resemblances best represent genetic affinities. In any case *B. crenulatum* has one near ally, namely, *B. robustum*, Rolfe, based on materials collected in Madagascar by the Rev. R. Baron, F.L.S. (nn. 2324, 2723), which is quite similar in habit and floral structure, but is more robust, has narrower lateral sepals, and the ovary is without the very characteristic serrulate wings of the present one.

Descr.—An epiphyte with stout, woody rhizomes. *Bulbs* broadly oblong, quadrangular, two-leaved, about an inch and a half long, an inch broad. *Leaves* elliptical-oblong, obtuse, subsessile, two to three inches long, nine lines broad, coriaceous. *Scapes* suberect, stoutish, five to six inches high, clothed with about six ovate-oblong apiculate sheaths four to six lines long, and tubular at the base; raceme drooping, two inches long, with a thickened, clavate rhachis, dense-flowered, dull purple. *Bracts* transversely oblong, obtuse, one line long, purple. *Flowers* two lines long. *Ovary* stout, with six serrulate angles or narrow wings. *Dorsal* sepal ovate, obtuse, three-nerved; lateral pair united into a broadly rounded, bilobed, fleshy organ, with serrulate margin, colour yellow, with reddish nerves. *Petals* linear-oblong, obtuse, one-nerved. *Lip* sunk into a cavity formed by the lateral sepals, ovate, obtuse, very fleshy, with a somewhat recurved margin and an irregular obscurely five-lobed callus on the disc. *Column* very short and broad, with a pair of broad tridenticulate teeth; foot short and broad, with a narrow attachment to the limb.—R. A. Rolfe.

Fig. 1, bract; 2, flower; 3, the same with the sepals removed; 4, lip; 5, column showing the teeth and foot; 6, anther case; 7, pollinia:—*all much enlarged.*

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Tab. 8001.

GNIDIA polystachya.

South Africa.

Thymelæaceæ. Tribe Euthymelæeæ.

Gnidia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 197; *Engl. & Prantl. Pflanzenf.* vol. iii. 6, A. p. 226.

Gnidia polystachya, *Berg. Descr. Pl. Cap. Bon. Spei*, p. 123 (1767); *Thunb. Fl. Cap. ed Schultes*, p. 380; ex affinitate *G. pinifoliæ*, Linn., a qua foliis floribusque brevioribus et petalis 8 glabris differt.

Frutex 1–4-pedalis, ramis adpresse pubescentibus. *Folia* sæpe conferta, interdum sparsa, patentia vel subimbricata, 1½–6 lin. longa, ⅓–¾ lin. lata, linearia, acuta vel subobtusa, dorso carinata, glabra. *Flores* terminales, capitati, foliis sublatioribus involucrati. *Calyx* flavus, extra interdum ruber, tenuiter pubescens; tubus 4–6 lin. longus, superne leviter infundibuliformis; lobi 1–1¼ lin. longi, ¾–1 lin. lati, ovati vel elliptico-oblongi, obtusi vel subacuti. *Petala* 8, ori tubi inserta, ½–⅔ lin. longa, oblonga vel lineari-oblonga, apice obtusa, emarginata, breviter bifida vel obliquе dentata, glabra, alba. *Stamina* 8, biseriata; filamenta brevissima; antheræ lineari-oblongæ, 4 superiores exsertæ, 4 inferiores inclusæ. *Ovarium* oblongum, apice pilosum; stylus oblique terminalis, filiformis, glaber, inclusus; stigma capitatum, piliferum.—*Gnidia carinata*, Thunb. Prodr. p. 76 (1794); Meisner in DC. Prodr. vol. xiv. p. 588; *G. pinifolia*, Wendl. Beobacht. p. 15, t 2, f. 11, non Linn. *G. simplex*, Andr. Bot. Rep. vol. i. t. 70. *G. imberbis*, Dryand. in Ait. Hort. Kew. ed. 2, vol. ii. (1811) p. 412; Bot. Mag. t. 1463; Lodd. Bot. Cat. t. 1958.

A figure of this pretty shrub was long ago published at t. 1463 of the *Botanical Magazine*, under the name of *G. imberbis*, but the form there depicted is so unlike the present one in habit, that it might be doubted if the two plates represented the same species. Upon examining the Kew material, however, I can find no specific distinction between them, the apparent difference being in habit only, due to variations in the mode of branching, of which I find three principal modifications: 1, with rather long, simple flowering branchlets; 2, shorter flowering branchlets arranged in a corymbose manner, which appears to be the most common form of the plant; 3, the form here figured, with short flowering branchlets racemosely arranged, on much elongated growths.

The last is very ornamental. Mr. Lynch writes that it is a very free-growing, densely branched shrub, five to

six feet high, and two feet six inches through. In habit it is light and graceful, and it bears hard pruning without detriment to its appearance when it has made fresh growth. It succeeds very well in a cool greenhouse, growing in the usual mixture of half each of peat and loam with some sand.

Like many others of the family to which it belongs, *G. polystachya* is remarkably heterostyled, since I find no fewer than three different lengths of style, accompanied by relative differences in the length of the permanent and deciduous parts of the calyx-tube, but apparently without a corresponding difference in the position of the anthers; nor do these sexual modifications appear to correspond to the different kinds of habit, which latter are perhaps local or individual modifications of the plant, which is found distributed along the coast region of South Africa from Caledon Division eastward to Bathurst Division. The specimen figured is from a plant grown in Cambridge Botanic Garden, which was raised from seed obtained from Warsaw Botanic Garden, and communicated in March, 1904, by Mr. R. I. Lynch, who states that he made good use of this plant in the decorations for the King and Queen at the Fitzwilliam Museum, Cambridge, on the occasion of the opening of the Botanical and other Laboratories on March 1st, 1904. The other two forms are also in cultivation, but are not so ornamental as that here pictured.

Descr.—A shrub one to four feet high, pubescent on the branches with rather long adpressed hairs. *Leaves* alternate, usually crowded, sometimes scattered, spreading or ascending, and more or less imbricate, one and a half to six lines long, one-third to three-fourths of a line broad, linear, acute, or subobtuse, keeled on the back, glabrous. *Flowers* in involucrate heads, terminating the branchlets, which in the form figured are short and racemosely arranged along the main branches. *Involucral bracts* like the leaves, but usually broader. *Calyx* yellow, or sometimes red outside where exposed to the sun, thinly covered with long adpressed hairs outside; tube four to six lines long, slightly funnel-shaped at the upper part; lobes one to one and a quarter line long, three-quarters to one line broad, ovate or elliptic-oblong, obtuse or subacute. *Petals*

eight at the mouth of the calyx-tube, half to two-thirds of a line long, oblong or linear-oblong, obtuse, emarginate, shortly bifid or obliquely and obtusely toothed at the apex. *Stamens* in two series, with very short filaments; anthers linear-oblong, the four upper exserted, the four lower included. *Ovary* oblong, with a tuft of hairs at the apex; style obliquely terminal, filiform, glabrous, included, but variable in length; stigma capitate, hairy.—N. E. Brown.

Fig. 1, leaf; 2, involucral bract; 3, flower; 4, flower laid open; 5 and 6, stamens; 7, pistil:—*all enlarged.*

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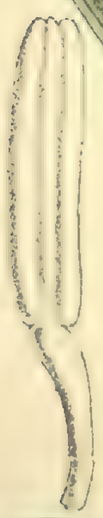

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Tab. 8002.

ROMNEYA TRICHOCALYX.

California.

Papaveraceæ. Tribe Romneyeæ.

Romneya, *Harv.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 74, t. 3.

Romneya trichocalyx, *Eastw. in Proc. Calif. Acad. Sc.* 3rd series, vol. i. p. 133, t. 11, f. 4; *G. Nicholson* in *Gard. Chron.* 1902, vol. ii. p. 190; *W. H.* l.c. 1904, vol. ii. p. 163; a *C. Coulteri*, Harv. differt imprimis calyce dense setoso.

Herba caulibus lignescentibus, a basi ramosa, ramis crassiusculis divaricatis, usque ad 5-ped. alta, undique glauca, passim setulis paucis instructa. *Folia* caulina petiolata, crassa, demum coriacea, pinnatifida, quam internodia longiora, maxima circiter 5 poll. longa, sursum gradatim minora, segmentis 7–3 integris vel paucidentatis apice callosis. *Pedunculi* terminales, uniflori, fere ad calycem foliiferi. *Flores* albi, maximi plane 6 poll. diametro. *Sepala* 6, fere orbicularia, circiter 8–9 lin. diametro, imbricata, setosa. *Petala* sæpius 6, sed numero ac circumscriptione variabilia. *Stamina* numerosissima, biformia, exteriorum filamentis longioribus infra medium purpureis, antheris luteis. *Carpella* circiter 10, stylis brevissimis incurvis. *Capsula* anguste ovoidea, circiter 9 lin. longa, densissime setosa, irregulariter dehiscens. *Semina* numerosissima, alba, reniformia, scrobiculata, circiter $\frac{3}{4}$ lin. longa.—*R. Coulteri*, Parsons, Wild Flowers of California, p. 64, cum ic. color., non Harv.

The genus *Romneya* was founded on *R. Coulteri*, Harv., and named after the Rev. Dr. T. Romney Robinson, "the Astronomer of Armagh." This, the only other species of the genus known, was introduced into this country by Messrs. E. G. Henderson & Son, about 1875. The exact date of the introduction of *R. trichocalyx*, Eastw., into cultivation is uncertain, because it was at first confused with *R. Coulteri*. In 1898 Miss A. Eastwood, Curator of the Herbarium of the Californian Academy, pointed out that two distinct species were under cultivation, and defined them in the place cited above. In 1902 Mr. G. Nicholson recorded the flowering of *R. trichocalyx* in the garden of Mr. H. C. Baker, Oaklands, Almondsbury, Gloucestershire, and this is apparently the earliest record of its cultivation in this country.

R. Coulteri, as may be imagined from the confusion of the two, very strongly resembles the present plant, but although introduced so long ago, it has never appeared in

this Magazine. From a horticultural standpoint there is little to choose between them. Both require a sheltered, sunny situation, and their full development depends greatly upon a warm season. On the Continent they flourish better than in our insular climate. Nevertheless, in a favourable situation *C. trichocalyx* has succeeded very well at Kew. Writing in the "Gardeners' Chronicle" on September 3rd, Mr. Hackett states that it had been in flower for two months in a recess on the eastern side of the Palm House. Its early flowering was due to the protection afforded by its sheltered position, and also, in part, to its having been covered during the preceding winter. Seeds were sent to Kew by Miss Eastwood in November, 1902. They were sown at once, and the young plants, after wintering in a cold frame, were placed in their present position in the spring of 1903. Miss Parsons says:—"It must be conceded the queen of all our flowers. It is not a plant for small gardens, but the fitting adornment of a park where it can have space, and light, and air."

Descr.—A robust, erect, glaucous herb branching from the base, slightly bristly on the petioles and elsewhere. *Stems* about five feet high, thick, becoming woody. *Stem-leaves* petioled, thick, at length leathery, pinnatifid, the largest about five inches long, gradually smaller upwards; segments seven to three, entire or sparsely toothed. *Peduncles* terminal, one-flowered, leafy almost up to the calyx. *Flowers* white, the largest fully six inches across. *Sepals* six, nearly orbicular, about eight or nine lines in diameter, overlapping, densely clothed with bristles. *Petals* commonly six, but variable in number and outline. *Stamens* very numerous; filaments purple below the middle; anthers yellow. *Capsule* of about ten carpels, narrow-ovoid, about nine lines long, densely clothed with rigid bristles, dehiscing irregularly. *Seeds* very numerous, small, reniform, white, minutely pitted.—W. Botting Hemsley.

Fig. 1, sepal from the outside, overlapped part petaloid; 2, an outer stamen; 3 and 4, front and back view of an inner stamen; 5, pistil:—*all enlarged.*

M S del, J.N. Fitch lith

Vincent Brooks Day & Son Lith Imp

Tab. 8003.

DENDROBIUM REGIUM.

India.

Orchidaceæ. Tribe Epidendreæ.

Dendrobium, *Swartz*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 498. *Pfitzer in Engl. & Prantl Pflanzenfam.* vol. ii. 6, p. 173.

Dendrobium (§ Eudendrobium) **regium,** *Prain in Journ. Asiat. Soc. Beng.* vol. lxxi. p. 80; *Rolfe in Orch. Rev.* vol. xii. p. 228; aff. *D. nobili,* Lindl., sepalis petalisque concoloribus labello unguiculato limbo suborbiculato **fauce luteo nec purpurato distincta.**

Herba epiphytica, dense cæspitosa, 6–12 poll. alta. *Caules* cylindrici, nodis paullo incrassatis; internodia 1–1¼ poll. longa. *Folia* lanceolato-oblonga, obtusa, 2–4 poll. longa, 9–10 lin. lata; vaginæ tubulosæ, albido-venosæ. *Racemi* axillares, breves, 2–3-flori. *Flores* speciosi, pallide roseo-purpurei, rubro-purpureo-venosi, labelli disco pallide luteo. *Bracteæ* late ovato-oblongæ, obtusæ, conduplicatæ, membranaceæ, 3 lin. longæ. *Pedicelli* graciles, circa 1¼ poll. longi. *Sepala* oblonga, obtusa; posticum 1¼ poll. longum; lateralia paullo breviora, subfalcata. *Petala* ovata, obtusa, 1¼ poll. longa. *Labellum* basi unguiculatum; limbus suborbicularis, circa 1 poll. longus, basi convolutus; discus puberulus. *Columna* lata, circa 3 lin. longa. *Mentum* saccatum, obtusum, circa 4 poll. longum.

The Indian species of *Dendrobium* are among the best-known of this large and polymorphic genus, more especially the section *Eudendrobium*, which contains most of the species so popular in gardens, and at the present time it is rare to find any novelty of this section. The present species is one of the exceptions, and one of the most remarkable that has appeared for a long time. It was discovered in a locality somewhat vaguely indicated as Lower Hindustan, and it flowered in the Royal Botanic Garden, Calcutta, in 1901, and was shortly afterwards described by Lieut.-Col. Prain. A plant sent to Kew flowered in July last. *D. regium* is more deciduous than *D. nobile*, and the period of flowering much later. In habit, however, the two species are remarkably alike, so much so that, apart from the rather more prominent veins of the leaf-sheaths in *D. regium*, it is difficult to distinguish them when out of flower.

D. regium grows well under the same conditions as the other deciduous *Dendrobia*, but, unlike them, does not

flower immediately after the resting period, and hence may require somewhat different cultural treatment at this period.

Descr.—A densely tufted epiphyte, six to twelve inches high. *Stems* cylindrical, slightly swollen at the nodes; internodes rather over an inch long. *Leaves* lanceolate-oblong, obtuse, two to four inches long, about nine lines broad, bright green; sheaths rather shorter than the internodes, with prominent white veins. *Racemes* axillary, short, two- or three-flowered. *Bracts* broadly ovate-oblong, obtuse, conduplicate, about three lines long, membranous. *Pedicels* slender, about an inch and a quarter long. *Sepals* oblong, obtuse; dorsal an inch and a half long; lateral pair rather shorter and somewhat falcate, light purple-rose, veins somewhat darker. *Petals* ovate, obtuse, as long as the dorsal sepal, and similar in colour. *Lip* clawed at the base, then expanded into a nearly orbicular limb, over an inch broad, convolute at the base; disc puberulous, light purple-rose, veins rather darker, and the throat clear yellow, surrounded by a narrow cream-white zone. *Column* stout, nearly three lines long, its foot united with the base of the lateral sepals, forming a broad, obtuse, saccate chin, over four lines long; anther-case puberulous.—R. A. Rolfe.

Fig. 1, column with its foot; 2 and 3, anther-case seen from front and side; 4, pollinia:—*all enlarged*.

M. S. del, J. N. Fitch lith.

Vincent Brooks, Day & Son Lith. Imp.

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Tab. 8004.

ROSA Hugonis

Western China.

Rosaceæ. Tribe Roseæ.

Rosa, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 625.

Rosa (§ Pimpinellifoliæ) **Hugonis,** *Hemsl. (sp. nov.)*; a speciebus hujus sectionis omnibus habitu, spinis et foliorum forma differt.

Frutex erectus, ætate quinque annorum 4–5 ped. altus. *Caules* recti, graciles, basi vix semipoll. diametro, glabri, armati, sed non modo *R. platyacanthæ* et *R. Ecæ*, spinosissimi, crebre lenticellati ramique brunneo-purpurei, nitidi, fere æqualiter circum-ramosi, ramis gracilibus arcuato-adscendentibus, ramulis ultimis gracillimis. *Aculei* heteromorphi, in ramis sterilibus cum setis interjecti, recti, maximi basi latiuscule dilatati, sed plerumque tennes. *Folia* in ramis floriferis fasciculata, pertenuia, 2–4 poll. longa, petiolo rhachique filiformi, citissimo glabrescentia, eglandulosa; stipulæ angustæ, parte libera parva squamiformi; foliola 5–11, præter terminale longiuscule petiolulatum brevissime petiolulata, ovalia, ovata, oblonga vel obovata, apice rotundata, basi sæpius cuneata, 3–9 lin. longa, per totam fere circumscriptionem minute serrata. *Pedunculi* solitarii, quam folia breviores vel paullo longiores. *Flores* lutei, circiter 2½ poll. diametro. *Calyx* extus glaber, lævis; lobi lineari-lanceolati, circiter 6 lin. longi, integri, acutissimi, intus tomentosi. *Petala* orbiculari-obovata, apice rotundata vel emarginata. *Carpella* circiter 12, villosa, stylis parce pilosis liberis, stigmatibus breviter exsertis crenulatis. *Fructus* maturus ignotus.

This elegant, yellow Rose was raised at Kew from seeds received, with others, from the Keeper of the Botanical Department of the British Museum, in 1899. They were collected by Father Hugh (otherwise Pater Hugo) Scallan, a Catholic missionary, in Western China, probably in the Province of Shensi or Szechuen. It is apparently quite hardy at Kew, flowering freely in the open air.

Exception may, perhaps, be taken to its being treated as a distinct species; but as it certainly deserves a distinctive name, it seems better to give it one, without tacking it on to any other. The late Prof. Crépin would probably have referred it to "*R. xanthina*, Lindl.," with which he associated *R. platyacantha*, Schrenk, and *R. Ecæ*, Aitch. Although Sir Joseph Hooker (B. M. t. 7666), and the late Mr. Franchet (*Nouv. Arch. du Mus. Par.* série 2, vol. v. p. 269, t. 15, f. 2) have followed Crépin,

I am unwilling to add another distinct form or variety or race to an already confusing combination. To begin with, *R. xanthina*, Lindl., was founded upon a figure in Lambert's collection, which has apparently not been seen by any subsequent writer on the subject. All Lindley says is: "A Rose with all the appearance of *R. spinosissima*, except having no setæ and double flowers the colour of *R. sulphurea*." On the other hand, *R. platyacantha* and *R. Ecæ* are very different from each other; they have been fully described, and they are represented in many herbaria by authentic specimens. Under cultivation *R. Hugonis* flowers much more freely than *R. Ecæ*, and should have a future.

Father Hugh sent no dried specimen of this Rose, and the nearest wild specimen I can find, either at Kew or the British Museum, is from the Ili district, in Chinese Turkestan, and is named "*R. pimpinellifolia flore luteo;*" but that has a setulose calyx-tube.

Descr.—An erect shrub, four to five feet high at five years of age. *Stems* straight, slender, branching almost regularly on all sides, purple-brown and shining, moderately spiny and lenticelled; ultimate lateral branchlets very slender, curved upwards, brighter coloured. *Prickles* various, interspersed with bristles on the sterile branches, straight, the largest dilated at the base, mostly slender. *Leaves* thin, glabrous, two to four inches long, petiole and rhachis almost thread-like; stipules very narrow, free part scale-like; leaflets five to eleven, almost sessile, oval to oblong or obovate, three to nine lines long, rounded at the tip, wedge-shaped at the base, minutely toothed except near the base. *Flower-stalks* solitary, about as long as the leaves. *Flowers* yellow, about two inches and a half across. *Calyx* smooth; lobes linear-lanceolate, very acute, about half an inch long, entire, tomentose inside. *Petals* orbicular-obovate, rounded or notched. *Carpels* about twelve, very hairy; styles free, shortly exserted. *Fruit* unknown.—W. Botting Hemsley.

Fig. 1, a carpel:—*enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lith. Imp

L. Reeve & Co. London.

Tab. 8005.

ÆCHMEA lavandulacea.

West Indies.

Bromeliaceæ. Tribe Bromelieæ.

Æchmea, *Ruiz & Pav.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 663; *Baker, Handb. Bromel.* p. 32; *Mez in DC. Monogr. Phan.* vol. ix. p. 176.

Æchmea lavandulacea, *C. H. Wright*, *sp. nov.*; species ab iis sectionis *Platyæchmeæ* panicula disticha, spicis non pedunculatis, bracteolis ovato-oblongis lavandulaceis albo-furfuraceis distinguitur.

Herba acaulis. *Folia* rosulata, e basi vaginante ligulata, utrinque appresse lepidota, circa 18 poll. longa, $1\frac{3}{4}$ poll. lata, spinis approximatis tenuibus incurvis instructa, marginibus cartilagineis angustis spinisque rubris. *Panicula* disticha, spicis multifloris sessilibus distichis composita; scapa circa 14 poll. longa, rosea; bracteæ scariosæ, ovato-oblongæ, superiores sensim minores, roseæ; bracteolæ late ovato-oblongæ, acuminatæ, virides, albo-furfuraceæ, marginibus scariosis latis lavandulaceis, inferiores apice aristatæ. *Sepala* ovato-lanceolata, coriacea, aristata, viridia, pilosa, 6 lin. longa. *Petala* oblanceolata, mucronata, atroviolacea, 10 lin. longa, $1\frac{1}{2}$ lin. lata prope apicem, squamis albis $2\frac{1}{2}$ lin. longis et plicis lanceolatis duabus 4 lin. longis instructa. *Stamina* petala subæquantia; antheræ oblongæ, apiculatæ, dorsifixæ; filamenta compressa, marginibus hyalinis. *Ovarium* pilosum; stylus filiformis, ramis brevibus spiraliter contortis.

This plant was discovered by Mr. W. E. Broadway, Curator of the Botanic Garden, Grenada, West Indies, on rocks overhanging the sea at St. George, in that island. In 1895 he forwarded plants to Kew, where they flowered in a stove in July last. The species is very distinct, and is characterized by the distichous arrangement of the panicle-branches and flowers. The broad lavender-coloured margins of the bracteoles, resembling in colour the flowers of some species of *Statice*, candied all over with white scurf, harmonize with the deep violet petals, and thus avoid that sharp contrast in colour so often found in the inflorescence of plants of this order.

Amongst the species allied to the present, *Æ. pubescens*, Baker, is distinguished by the leaves being smaller and bearing spines, which are recurved, only in the lower part, while its bracteoles are shorter, broader, and more abruptly acuminate. *Æ. lingulata*, Baker, has the panicle branches inserted all round the axis. *Æ. dichlamydea*, Baker, has the spikes distichously arranged, but naked in the lower three inches.

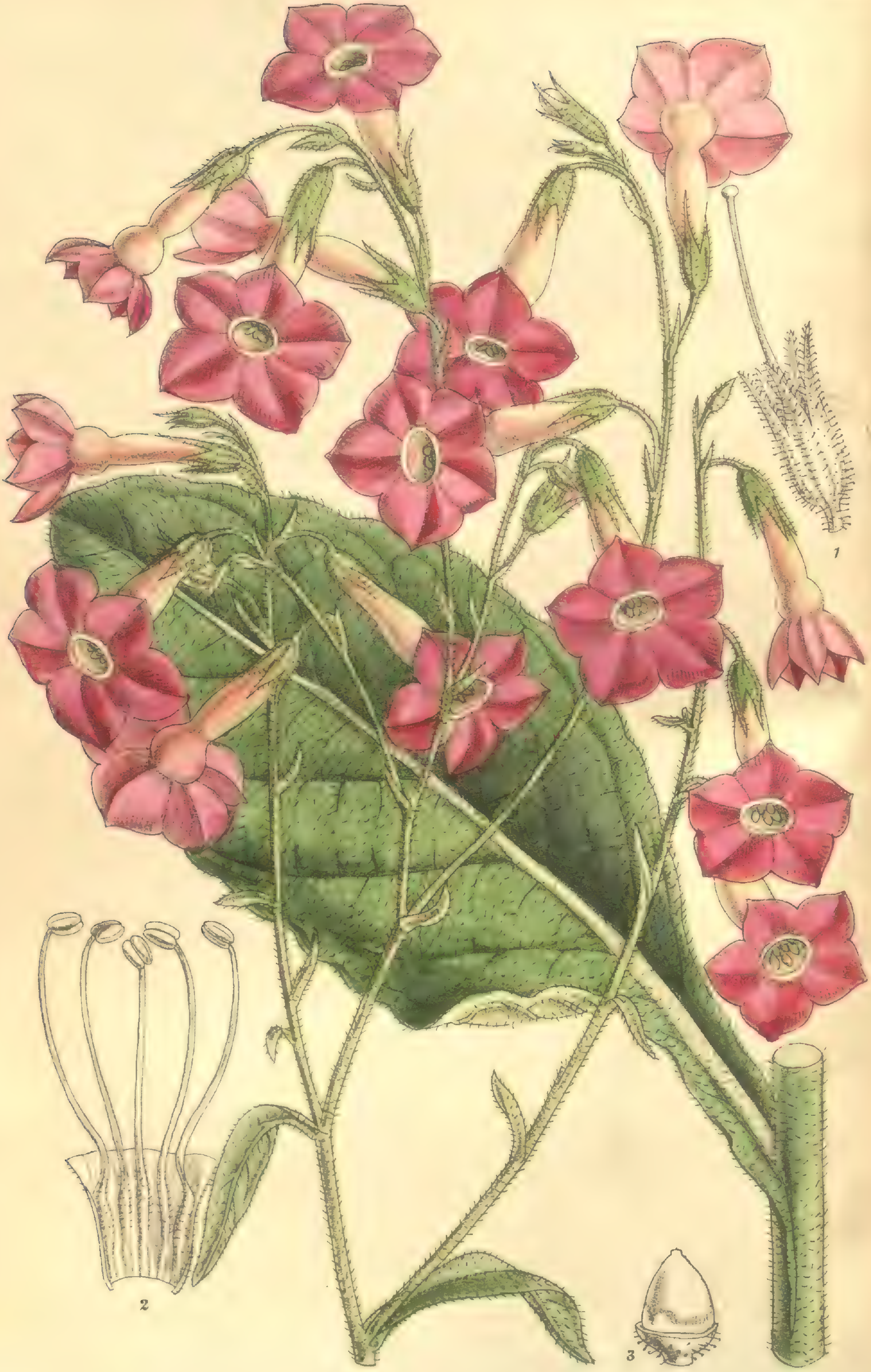
March 1st, 1905.

Mr. J. G. Baker (*l.c.*) enumerates 128 species of *Æchmea*, but seven years later Dr. Mez (*l.c.*), after describing several new species, and restoring *Canistrum* and *Hohenbergia* to generic rank, reduces the number to 114. All these are natives of Tropical America and the West Indies.

We do not find any figure resembling the present plant in the magnificent collection of drawings, now at Kew, formerly belonging to the late Prof. Ed. Morren.

Descr.—A stemless perennial. *Leaves* rosulate, ligulate from a sheathing base, about eighteen inches long and an inch and three-quarters wide, minutely lepidote on both surfaces; margins narrow, cartilaginous, red; spines approximate, slender, red, curved upwards. *Panicle* distichous, formed of numerous, sessile, many-flowered, distichous spikes; scape about fourteen inches long, rosy; bracts scarious, ovate-oblong, decreasing in size upwards, rosy; bracteoles broadly ovate-oblong, acuminate (the lower aristate), green covered with white scurf, margins broad, scarious, lavender-coloured. *Sepals* ovate-lanceolate, aristate, coriaceous, green, pilose, six lines long. *Petals* oblanceolate, mucronate, with two lanceolate folds about four lines long on the upper surface, deep violet, ten lines long, a line and a half wide near the apex, basal scales white, two lines and a half long. *Stamens* about as long as the petals; anthers oblong, apiculate, dorsifixed near the middle; filaments compressed, with hyaline margins. *Ovary* pilose; style filiform, branches short, spirally twisted.—C. H. Wright.

Fig. 1, flower; 2, petal and stamen; 3, anther; 4, style-arms; 5, sketch of the whole plant :—1–4 *enlarged*, 5 *much reduced*.



M.S del. J.N.Fitch lith.

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Tab. 8006.

NICOTIANA FORGETIANA.

Brazil.

Solanaceæ. Tribe Cestrineæ.

Nicotiana, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 906; *Comes, Monographie du Genre* **Nicotiana.**

Nicotiana forgetiana, *Hort. Sand. Verulamii*; species sectionis *Petunioides*, G. Don, et ex affinitate *N. bonariensis*, Lehm., a qua foliis superioribus lineari-lanceolatis, nec repandis, calycis lobis valde inæqualibus et corollæ lobis medio costatis differt.

Herba annua, 2–3-pedalis, a basi ramosa. *Folia* papyracea, pubescentia, radicalia oblongo-lanceolata, maxima circiter pedalia, obtusa, deorsum in petiolum alatum attenuata, leviter undulata; caulina similia sed minora et ovata, petiolis decurrentibus. *Paniculæ* amplæ, laxe ramosæ, ramis gracilimis glanduloso-pubescentibus; bracteæ inferiores foliaceæ, angustæ, acutæ, sursum gradatim minores, superiores minutæ. *Pedicelli* filiformes, quam flores breviores. *Calyx* hispidulus, circiter semipollicaris, inæqualiter 5-dentatus, dentibus fere setiformibus longioribus tubum excedentibus. *Corolla* anguste infundibuliformis vel fere hypocrateriformis, circiter $1\frac{1}{4}$ poll. longa, parcissime pilosula, tubo prope basin attenuato; limbus patens, circiter 1 poll. diametro; segmenta subæqualia, deltoidea, venosa, costata, obtusiuscula. *Stamina* inclusa; filamenta basi corollæ adnata, hirsuta, parte libera filiformi basi geniculata, glabra. *Pistillum* glabrum, stylo incluso, stigmate filiformi. *Capsula* mihi ignota.

The name *Nicotiana forgetiana* has appeared in most of the gardening papers; but, so far as I am aware, no description of the plant has hitherto been published. It was introduced from South Brazil by Messrs. Sander & Sons of St. Albans, through their collector, Mr. Forget, about four years ago, and it is one of the parents of the beautiful hybrid *N. Sanderæ*, which is being advertised by the same firm. It appears to be as free a grower as the well-known *N. alata*, Link. & Otto (syn. *N. affinis*, Moore), which is the other parent of *N. Sanderæ*, and now that hybrid breeding has been started between these and other species we may expect to see the genus *Nicotiana* occupying a much more prominent position in gardens than hitherto. Although *N. forgetiana* itself is a highly ornamental plant, it is not offered for sale, but it will be represented in gardens by the more brilliantly coloured hybrids.

March 1st, 1905.

The most recent monograph of the genus * contains descriptions of forty-one species, under many of which several varieties are defined, some of which have generally been regarded as distinct species. The author also describes and discusses the various kinds cultivated for smoking in all parts of the world, with references to figures and existing literature. For instance, under *N. Tabacum*, var. *havanensis*, he first enumerates the "Genuinæ," or those sorts obtained without crossing, with their commercial names, and the countries in which they are cultivated. Following these come the hybrids belonging to this group, the parentage of which is set forth.

Our figure of *N. forgetiana* was prepared from specimens supplied by Messrs. Sander.

Descr.—An annual herb, two to three feet high, branching from the base. *Leaves* papery, soft, pubescent; radical oblong-lanceolate, largest about a foot long, obtuse, tapering downwards into a winged petiole, slightly undulate; cauline similar, but smaller, ovate, with decurrent blades. *Panicles* ample, loosely branched; branches very slender, glandular-pubescent; lower bracts leafy, narrow, acute, gradually smaller upwards; uppermost minute. *Pedicels* filiform, shorter than the flowers. *Calyx* small, clothed with harsh hairs, five-toothed; teeth unequal, very slender, rigid. *Corolla* narrow, funnel-shaped, about one inch and a quarter long and one inch in diameter, very sparsely hairy; segments of the limb nearly equal, triangular, obtuse. *Stamens* included; filaments hairy at the base as far as they are attached to the corolla, geniculate just above the attachment, thence filiform and glabrous. *Ovary* glabrous, as well as the filiform included style.—W. Botting Hemsley.

Fig. 1, calyx and pistil; 2, corolla laid open, showing the attachment of the stamens; 3, ovary:—*all enlarged.*

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* Monographie du Genre Nicotiana . . . par le Dr. Prof. O. Comes. Naples, 1899.

M. S. del. J. N Fitch lith.

Vincent Brooks, Day & Son Lt.d Imp.

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Tab. 8007.

CATASETUM CHRISTYANUM.

Amazon District.

Orchidaceæ. Tribe Vandeæ.

Catasetum, *Rich.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 551; *Rolfe in Journ. Linn. Soc.* vol. xxvii. p. 206.

C. christyanum, *Reichb. f. in Gard. Chron.* 1882, i. p. 588; 1895, ii. pp. 617, 618, fig. 104; species ex affinitate *C. saccati,* Lindl., sepalis petalisque angustioribus, labello trifido laciniis refractis distinctum.

Herba epiphytica, circa 1 ped. alta. *Pseudobulbi* fusiformi-oblongi, 4–6 poll. longi, vaginis vestiti. *Folia* oblongo-lanceolata, acuta vel acuminata, plicata, 3–5-nervia, 6–9 poll. longa, pallide viridia. *Scapi* axillares, prope basin pseudobulbi producti, arcuati, circa 1 ped. longi, prope basin vaginis tubulosis vestiti; racemi laxi, multiflori. *Bracteæ* oblongæ, acutæ, paullo concavæ, 4–8 lin. longæ. *Pedicelli* 1–2 poll. longi. *Flores* circa 4 poll. diametro, pallide virides, sepala et petala rufo-brunneo-maculata, labellum viride brunneo suffusum, os sacci album. *Sepala* patentia, lineari-lanceolata, acuminata vel acuta, circa 2 poll. longa; lateralia subfalcata. *Petala* sepalis similia cum sepalo postico galeam formantia. *Labellum* trifidum, lobis reflexis; lobus intermedius late ovato-oblongus vel suborbicularis, apiculatus, circa 6 lin. longus, margine profunde fimbriatus, lobi laterales rotundati, profunde fimbriati; saccus latus, obtusus; os transverse oblongum, medio constrictum; callus conicus, obtusus. *Columna* clavata, circa 1 poll. longa; antennæ graciles, divergentes; anthera longe apiculata.

Catasetum is one of the most remarkable genera of Orchids. Its flowers are quaint in structure, very polymorphic in the different sections of which it is composed, and unisexual, the two sexes being completely diverse in appearance. The females are produced very rarely, and of the sixty or more described species they are only known in about a third. They are also remarkably uniform in appearance, as compared with the other sex, and indeed difficult to determine in the absence of the males. This diversity is very well illustrated by the plate of *C. Randii*, Rolfe (B. M. t. 7470), which is the solitary example out of nineteen species already figured in this Magazine where both sexes are represented.

Catasetum christyanum was originally flowered by Mr. Thomas Christy, F.L.S., at Sydenham, and was described in 1882, but since that time it has appeared in numerous collections. It is a striking species, most nearly allied to *C. saccatum*, Lindl., which seems to have been lost sight of

for some years. The flowers figured are males, the females being unknown, though two flowers appeared in the collection of Sir Trevor Lawrence, Bart., in November, 1894, which were intermediate in structure, being mostly male, but having the saccate lip of the female.

The plant figured was purchased in 1894. It flowered in a tropical house at Kew in early winter; but it is not quite constant in its period of flowering.

Descr.—A tufted epiphyte about a foot high. *Bulbs* fusiform-oblong, four to six inches long, clothed with the persistent leaf-sheaths. *Leaves* oblong-lanceolate, acute or acuminate, plicate, three- to five-nerved, six to nine inches long, light green. *Scape* axillary from near the base of the bulb, a foot or more long; raceme lax, many-flowered. *Bracts* oblong, acute, somewhat concave, four to eight lines long. *Pedicels* one to two inches long. *Flowers* about four inches across, light green, heavily blotched with red-brown on the sepals and petals, the lip brown and green with a white area round the mouth of the sac. *Sepals* spreading, linear-lanceolate, acuminate or acute, about two inches long, lateral pair somewhat falcate. *Petals* similar to the sepals and parallel to the dorsal, forming a narrow hood over the column. *Lip* strongly three-lobed; lobes reflexed; front lobe broadly ovate-oblong or nearly orbicular, apiculate, nearly half an inch long; margin deeply fimbriate; side lobes rounded, shorter than the front lobe, deeply fimbriate; sac broad and obtuse, the mouth transversely oblong, somewhat constricted in the middle. *Column* clavate, over an inch long, bearing a long, slender, curved appendage at the summit; rostellar arms long and slender, one curved forward over the mouth of the spur, the other descending by the side of the column; anther-case bearing a long, slender appendage at the apex.—R. A. Rolfe.

Figs. 1 and 2, front and back view of lip; 3, anther case; 4 and 5, pollinia, with the stipes and gland, seen from front and back:—*all magnified.*

M.S. del. J.N.Fitch lith.

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Tab. 8008.

DERRIS alborubra.

China.

Leguminosæ. Tribe Dalbergieæ.

Derris, *Lour.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 549.

Derris alborubra, *Hemsl.* (*sp. nov.*); ex affinitate *D. uliginosæ*, Benth., a qua foliolis emarginatis, alabastris sericeis et legumine circumalato differt.

Frutex scandens vel vagans, saltem 18-pedalis, præter inflorescentiam glaber. *Rami* crassiusculi, verruculosi, juniores virides, internodiis sæpe elongatis. *Folia* persistentia, alterna, petiolata, maxima 6–7 poll. longa, petiolo valido basi incrassato supra ut rhachi canaliculato; foliola sæpius 5, interdum 3, opposita, breviter petiolulata, coriacea, supra atroviridia, inæqualia, inferiora minora, obovato-oblonga, sæpius $2\frac{1}{2}$–$3\frac{1}{2}$ poll. longa, suprema interdum minora, apice rotundata et emarginata, basi rotundata vel rare subcuneata; costa supra impressa, subtus elevata, venis primariis lateralibus utrinque circiter 9 inconspicuis; stipulæ minutæ, citissimo deciduæ. *Flores* odorati, in paniculas laterales et terminales angustas interdum usque ad 1 ped. longas pendentes dispositi, ramuli pedicellique graciles, puberuli; bracteæ bracteolæque minutissimæ; pedicelli quam flores breviores. *Calyx* ruber, primum sericeo-hirsutus, deinde glabrescens, oblique campanulatus, vix 2 lin. longus, obscure bilabiatus, lobis brevissimis antico longiore. *Petala* alba, unguiculata, 5–6 lin. longa, apice puberula; vexillum fere orbiculatum, cucullatum, emarginatum, inappendiculatum; alarum limbus basi biauriculatus, apice obtusus; carinæ petala dolabriformia, apice rotundata, supra medium connata. *Stamina* monadelpha, dorsali basi libero; antheræ uniformes. *Ovarium* sessile, pubescens, 4-ovulatum; stylus supra medium glaber, stamina paullo excedens. *Legumen* planum, coriaceum, glabrum, utrinque alatum, sæpissime monospermum, oblique ellipticum, circiter $1\frac{1}{2}$ poll. longum, interdum pleiospermum et longius. *Semina* perfecta non visa.

A plant of this pretty, evergreen climber was sent to Kew from Hong Kong, in 1900, by Mr. C. Ford, I.S.O., under the name of *Derris Fordii*, Oliv. He also sent pods, containing imperfect seeds, bearing the same name. It was taken for granted that Mr. Ford was familiar with the *D. Fordii*, Oliv. (*Hook. Ic. Pl.* t. 1771), as it was founded upon specimens supplied by him. Last August the plant now figured flowered profusely in the Palm House, where it covered some square yards of the roof, and it proved to be a different species from *D. Fordii*, but identical with specimens in the Kew Herbarium from Hainan, collected by Dr. A. Henry (8228 and 8394).

Another Chinese species of *Derris*, from Kwantung, identified by the late Dr. Hance with *D. oblonga* from

Ceylon (see *Journ. Linn. Soc.* vol. xxiii. p. 199) proves, as was suspected, to be distinct. It resembles *D. alborubra* in having a red calyx, and in other particulars.

D. Hancei, *Hemsl.* (*sp. nov.*); *D. oblonga*, Benth., similis ab ea tamen foliolis paucioribus et calyce extus glabro differt.

Descr.—A climbing, evergreen shrub, with stems at least eighteen feet in length, glabrous, except in the inflorescence. *Branches* green when young. *Leaves* pinnate, largest six to seven inches long; petiole thickened at the base, channelled above; leaflets usually five, occasionally three, shortly petiolulate, coriaceous, dark green above, obovate-oblong, two inches and a half to three inches and a half long, uppermost even smaller, rounded and notched at the tip; midrib sunk below the upper surface; venation exceedingly fine. *Flowers* in lateral and terminal panicles, sometimes a foot or more in length, fragrant; branches and pedicels slender, slightly hairy. *Calyx* red, silky-hairy at first, obliquely campanulate, about two lines deep, obscurely lobed. *Petals* white, clawed; standard almost orbicular; limb of the wing-petals two-eared at the base; keel rounded at the tip. *Stamens* monadelphous. *Ovary* sessile, pubescent; ovules four. *Pod* flat, coriaceous, glabrous, winged on both sides, almost always one-seeded, obliquely oval, about an inch and a half long. *Seeds* not seen in a perfect condition.—W. Botting Hemsley.

Fig. 1, calyx and pistil; 2, standard; 3, a wing-petal; 4, a keel-petal; 5, androecium; 6 and 7, anthers; 8, pod; 9, seed attached:—*all except* 8 *and* 9 *enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks Day & Son Lt.d Imp.

Tab. 8009.

BURBIDGEA SCHIZOCHEILA.

Malaya.

Scitamineæ. Tribe Zingibereæ.

Burbidgea, *Hook. f. in Bot. Mag.* t. 6403; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 647; *Engler, Pflanzenr. Zingiber.* p. 281.

Burbidgea schizocheila, *Hort. Buitenz. ex W. Hackett in Gard. Chron.* 1904, vol. ii. p. 301, a *B. nitida,* Hook. f., lamina labelli quam staminis connectivum obtusum angustiore et perianthii segmentis interioris aurantiaco-luteis differt.

Caules tenues, 9–15 poll. alti. *Folia* elliptica, acuminata, basi cuneata, 5 poll. longa, 3 poll. lata, supra viridia, subtus brunneo-purpureo tincta, marginibus angustis brunneo-purpuratis; vaginæ 5 poll. longæ, rubro-purpureæ; ligulæ scariosæ; petioli 1½ poll. longi, brunnei. *Panicula* terminalis, 9–12-flora. *Calyx* tubularis, 9 lin. longus, 2 lin. diam., breviter bidentatus. *Petala* 2 poll. longa, lutea, posticum ovatum, apice longe cucullatum, 5 lin. latum, lateralia oblonga, obtusa, 3 lin. lata. *Labellum* bifidum, apice intus pilosum. *Anthera* 3 lin. longa, connectivo apice in appendicem obcuneatam obtusam irregulariter dentatam producto. *Ovarium* viride; stylus filiformis, stigmate triangulari, medio excavato.

The plant was received at Kew in 1903 from the Buitenzorg Botanic Gardens, under the name of *Burbidgea schizocheila,* but it does not appear to have yet been described, and no information is available as to its original habitat. The only other species of the genus *B. nitida,* Hook. f. (B. M. t. 6403), is a native of Borneo.

In habit *Burbidgea* resembles *Hedychium,* but the flowers are destitute of any trace of lateral staminodes.

There is a drawing at Kew of a plant collected in Borneo by Mr. (now Sir Hugh) Low, which much resembles this species, but the corolla is of a similar colour to that of *B. nitida.*

Descr.—*Stem* slender, nine to fifteen inches high. *Leaves* elliptic, acuminate, cuneate at the base, five inches long, three inches wide, green above, narrowly edged and tinged beneath with brownish-purple; sheaths five inches long, claret colour; ligules scarious; petioles an inch and a half long, brown. *Panicles* terminating the leafy stems, nine- to twelve-flowered. *Calyx* tubular, nine lines long, two lines in diameter, shortly two-toothed. *Corolla* two inches long, orange-yellow; posterior petal ovate, five lines

wide, long-cucullate at the apex; lateral petals oblong, obtuse, three lines wide. *Lip* bifid, pilose inside at the apex. *Anther* three lines long; connective produced at the apex into an obcuneate, obtuse, irregularly toothed appendage, rather longer than the lip. *Ovary* green; style filiform; stigma triangular, hollowed in the middle.—C. H. Wright.

Fig. 1, flower with upper part of corolla removed; 2, lip; 3, anther and style; 4, style and stigma:—*all enlarged*.

1.

3

2

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lith.d Imp.

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Tab. 8010.

COTONEASTER ROTUNDIFOLIA.

North India.

Rosaceæ. Tribe Pomeæ.

Cotoneaster, *Medik.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 627.

Cotoneaster rotundifolia, *Wall. Cat.* n. 663; *Lindl. Bot. Reg.* sub tab. 1229; *Saunders Ref. Bot.* vol. i. t. 54; *Hook. f. Fl. Brit. Ind.* vol. ii. p. 386; inter affines fructus magnitudine distincta.

Frutex suberectus, 3–4-pedalis, dense ramosus, ramis sæpe distichis pubescentibus. *Folia* decidua, disticha, distincte petiolata, crassiuscula, sæpius fere orbicularia, maxima circiter ½ poll. diametro, interdum obovata, apiculata, glabrescentia, subtus pallidiora; stipulæ lineares, persistentes. *Flores* roseo-albi, circiter ½ poll. diametro, brevissime pedicellati. *Calyx* glabrescens, lobis rotundatis ciliolatis in fructu persistentibus. *Petala* fere orbicularia. *Stamina* quam petala breviora. *Fructus* turbinatus, circiter ½ poll. longus, saturate coccineus.—*C. microphylla*, var *uva-ursi*, Lindl. Bot. Reg. t. 1187; *C. prostrata*, Baker, Saunders Ref. Bot. t. 53.

It is a singular thing, that with the exception of *C. laxiflora*, Jacq. (t. 3519), which is not a particularly showy species, the ornamental genus *Cotoneaster* has been, till now, unrepresented in this Magazine. *C. rotundifolia* is one of the most desirable for winter decoration, and the only one in the open collection at Kew that carried its berries through the severe frosts and destructive fogs of the last season. In the middle of February it was still in excellent condition south of the Temperate House.

C. horizontalis, Dcne., was also very striking at Kew last season, though it did not retain its beauty so long as *C. rotundifolia*. A coloured figure of it is given in the "Revue Horticole" (1889, p. 348), with smaller pieces of several other species for comparison.

Among the more recently introduced species of Chinese origin, *C. pannosa*, Franch., and *C. Franchetii*, Bois, are specially deserving of notice. They are quite distinct from the present one in having slender branches, and consequently a more graceful habit. There is a coloured figure of the former in "Le Jardin" (1898, p. 120), which represents the somewhat smaller, deep crimson berries as clustered at the ends of short, lateral branchlets. The latter is reported from elevations of above 8,000 feet in Eastern Tibet.

April 1st, 1905.

Descr.—A suberect, densely-branched shrub, three to four feet high. *Branches* more or less in two rows, pubescent. *Leaves* deciduous, usually in two rows, distinctly stalked, rather thick, usually round, about half an inch across, sometimes obovate, apiculate, becoming glabrous. *Flowers* pink and white, about half an inch across, very shortly stalked. *Calyx* almost smooth; lobes rounded, finely ciliate on the margin. *Petals* almost round. *Stamens* shorter than the petals. *Fruit* top-shaped, about half an inch long, deep crimson.—W. Botting Hemsley.

Fig. 1, enlarged leaf; 2, enlarged flower.

M. S. del. J. N. Fitch lith.

Vincent Brooks, Day & Son Lt.d Imp.

Tab. 8011.

PINANGA maculata.

Philippine Islands.

Palmæ. Tribe Arecæ.

Pinanga, *Blume*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 884; *Beccari, Malesia,* vol. iii. pp. 110 et 145.

Pinanga maculata, *Porte ex Lem. in Ill. Hort.* vol. x. (1863), t. 361; *Drude in Bot. Zeit.* 1877, p. 636, t. 5, figs. 12–13; habitu *P. Veitchii,* Wendl., similis sed floribus spiraliter dispositis differt.

Caules cæspitosi, tenues, 3½ ped. alti, brunneo-purpurei. *Folia* elliptica, fere ad medium bifida, apice serrata, maculata; vagina longe fusiformis; petiolus brevis. *Spadix* infra-foliacea, recurva, pilosa, indivisa; flores spiraliter dispositi, ternatim aggregati, intermedio femineo, lateralibus masculis. *Flores* ♂; calycis lobi late triangulares, breviter acuminati; petala suborbicularia; stamina numerosa, filamentis brevibus, ovoideis, antheris oblongis, quam filamenta 2–3-plo longioribus. *Flores* ♀ rubri: sepala petalaque orbicularia vel fere reniformia, ciliata; staminodia nulla; ovarium breviter oblongum, stigmatibus 3, sessilibus; ovulum parvum, basale. *Fructus* ignotus.

Like many other garden palms, this was originally described from a barren plant, and we have been unable to find any record of its flowering, beyond a description and figure of the ovule by Drude, until the subject of this plate flowered in a stove at Kew in November last. The flowers then produced confirm the original guess that the plant is a *Pinanga*, in which genus Beccari enumerated it as an imperfectly known species. Our plant was received in 1900 from the Botanic Garden, Penang. It is a native of humid forests in the Philippines at altitudes of 1,200–1,500 feet, and is said to flower there first when about nine feet high. The Kew plant, however, produced flowers when about one-third that height.

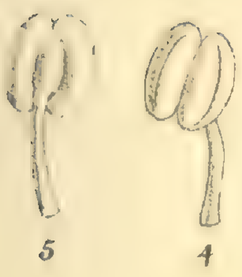
The genus *Pinanga* is represented at Kew by nearly a dozen species in cultivation; but, among small Palms, they do not flower so freely as the members of the New World *Chamædorea*. The only other *Pinanga* figured in this Magazine (t. 6581) is the very pretty *P. patula*, Blume, which formerly flowered and fruited annually at Kew, but it is no longer represented in the collection.

About half a dozen species are figured in the "Annales

du Jardin Botanique de Buitenzorg," from the rich collection of Palms cultivated in that renowned garden.

Descr.—*Stems* cæspitose, slender, about three and a half feet high, brownish-purple. *Leaves* elliptical, bifid nearly to the middle, sometimes with a pair of basal leaflets, lobes serrate at the apex, green, with darker spots; sheath long, spindle-shaped; petiole short. *Spadix* below the leaves, recurved, pilose, simple; flowers in spirally arranged groups of three, the central female, the lateral male and deciduous before the female opens. *Male flowers*: calyx-lobes broadly triangular, shortly acuminate; petals sub-orbicular; stamens many, filaments short, anthers oblong, two or three times as long as the filaments. *Female flowers* bright red: sepals and petals orbicular or almost reniform, ciliate; staminodes none; ovary shortly oblong; stigmas three, sessile; ovule small, basal.—C. H. Wright.

Figs. 1 and 2, male flowers; 3, calyx; 4 and 5, stamens; 6, female flowers; 7, the same with the sepals removed; 8, longitudinal section of the pistil:—*all except* 1 *enlarged.*



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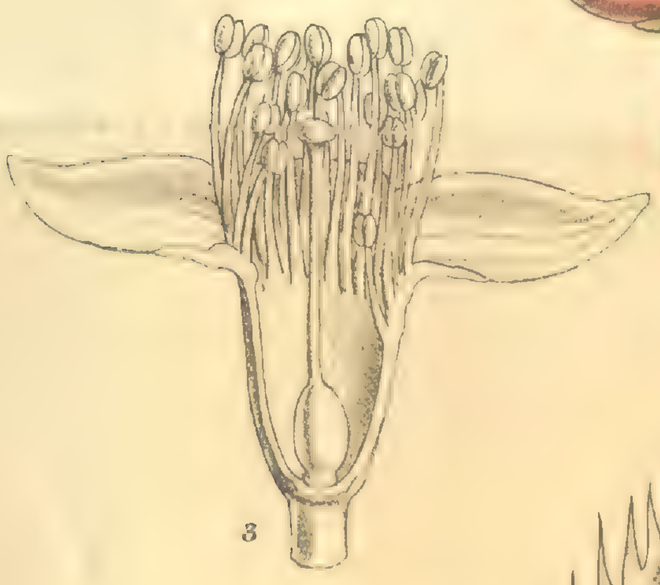

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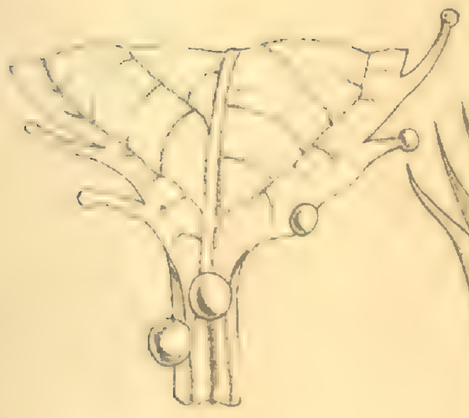

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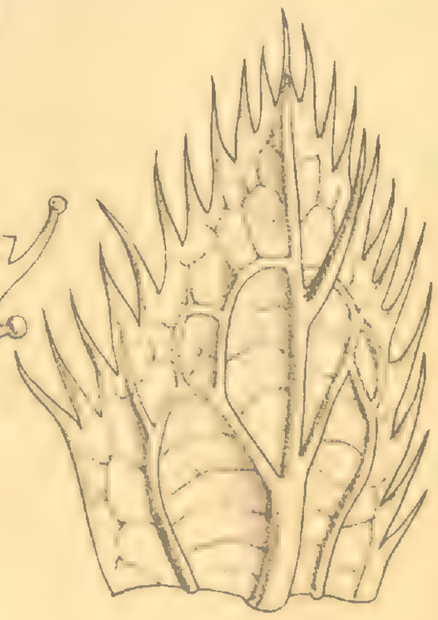

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M.S. del. J.N. Fitch lith.

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Tab. 8012.

PRUNUS Pseudo-cerasus.

Japan and China.

Rosaceæ.—Tribe Pruneæ.

Prunus, *L.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 609.

Prunus Pseudo-Cerasus, *Lindl. in Trans. Hort. Soc.* vol. vi. (1826), p. 90; *Forbes & Hemsley, in Journ. Linn. Soc.* vol. xxiii. p. 221; affinis *P. Ceraso*, L., et *P. avium*, L., differt foliis cuspidato-serratis, bracteis foliaceis majusculis plerumque fimbriatis vel fimbriato-laciniatis, receptaculo infundibulari, a priore etiam drupa minore.

Arbor in patria alta, facie *P. Cerasi* ramis oblique erectis cortice brunneo tectis, ramulis juventute tenere villosis mox glabratis. *Folia* post flores evoluta, elliptica vel ad ovatum vel obovatum vergentia, subabrupte acuminata, acumine sæpe longo angusto, basi rotundata, 2–6 poll. longa, $1\frac{1}{4}$–3 poll. lata, dense inæqualiter cuspidato-serrata, plerumque juventute pubescentia, cito glabrata, raro jam in gemma glabra, nervis lateralibus utrinque 6–11; petiolus 1–$1\frac{1}{2}$ poll. longus, apicem versus biglandulosus; stipulæ anguste lineares vel fere filiformes $\frac{1}{2}$–$1\frac{1}{4}$ poll. longæ, glanduloso-fimbriatæ, caducæ. *Flores* in corymbis 3–5-floris brevissime vel longiuscule pedunculatis bracteatis; pedunculus basi perulis majusculis sæpe purpurascentibus demum deciduis cinctus; bracteæ saltem in corymbis distincte pedunculatis foliaceæ, sæpe amplæ, fimbriatæ vel fimbriato-laciniatæ; pedicelli longiores pollicares. *Receptaculum* infundibulare. *Sepala* ovata vel lanceolata, longitudine receptaculi, integra. *Petala* rosea vel alba, late elliptica vel obovato-rotundata, emarginata, patula, $\frac{1}{2}$–$\frac{4}{5}$ poll. longa. *Stamina* et *stylus* glaber petala dimidia æquantia. *Drupa* pisiformis, nigra, carne parca; putamen subcompressum.—*P. paniculata*, Edw. in Bot. Reg. tab. 800 (non Thunb.). *Cerasus Sieboldtii*, Carr. in Rev. Hort. (1866), p. 371 cum tab.; *C. lannesiana*, Carr. l.c. (1872), p. 198 et (1873), p. 351 cum tab.; *C. caproniana flore roseo pleno*, Van Houtte in Fl. des Serres, xxi. (1875), p. 141, tab. 2238–39; *C. serratifolia*, Lindl. ex Carr. l.c. (1877), p. 389 cum tab.; *C. Wattererii*, Hort. ex Lavall., Ic. Arb. et Frut. Segrez. p. 119.

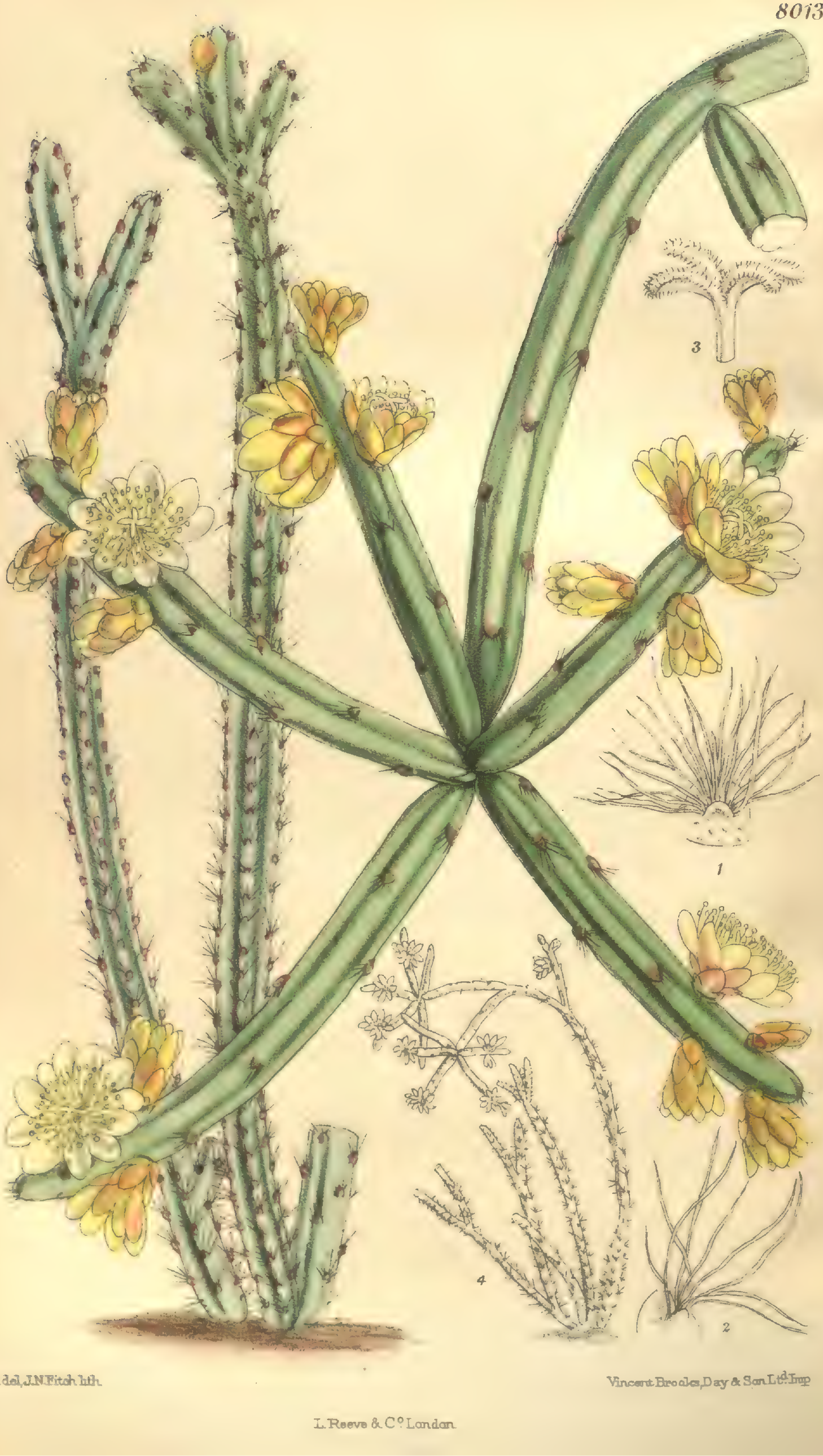
Prunus Pseudo-cerasus is a common forest tree of Japan, and has, for centuries, been cultivated in that country in numerous varieties, differing mainly in the colour and size of the flowers, their single or double condition, and in the degree of pubescence of the young branches and leaves. So greatly appreciated is this tree in Japan that its blossoming is the occasion of a great national festival. The area of the species extends northwards to the island of Sachalin and the opposite mainland, and through Northern and Central China to West Szechuen.

It was introduced into this country in a white and single-flowered form from China in 1819. The pink and

double-flowered varieties now in cultivation are, however, of Japanese origin, the first of them (subsequently described as *Cerasus Sieboldtii*, Carr.) having been imported from Japan by Robert Fortune in 1864. The tree flowers with us in April, before the unfolding of the leaves.

Descr.—A tree, attaining considerable height in its native country, with obliquely erect, brownish branches, which when young are more or less pubescent, but soon become glabrous. *Leaves* unfolding after the flowers, elliptic or somewhat obovate or ovate, rather abruptly contracted into a long and slender point, rounded at the base, sharply and closely cuspidate-serrate, 2–6 in. long, $1\frac{1}{4}$–3 in. broad, with 6–11 nerves on each side; petiole 1–$1\frac{1}{2}$ in. long, with two glands in the upper part; stipules narrow-linear or filiform, with gland-tipped fimbriæ, caducous. *Flowers* in 3–5-flowered corymbs on very short or long peduncles; peduncles surrounded at the base by rather large, often purplish bud-scales; bracts, at least in the distinctly peduncled corymbs, herbaceous, often large, fimbriate or fimbriate-laciniate; pedicels up to over 1 in. long. *Receptacle* funnel-shaped. *Sepals* ovate or lanceolate, as long as the receptacle, entire. *Petals* white or rose-coloured, broad, elliptic or obovate-rotundate, emarginate, $\frac{1}{2}$–$\frac{4}{5}$ in. long, spreading. *Stamens* and the glabrous *style* reaching to the middle of the petals. *Drupe* of the shape and size of a small pea, slightly compressed, black, with scanty flesh.—Otto Stapf.

Fig. 1, base of a leaf; 2, tip of a leaf; 3, section of flower, with the petals removed; 4 and 5, stamens :—*all enlarged.*



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Tab. 8013.

RHIPSALIS DISSIMILIS *var.* SETULOSA.

Brazil.

CACTACEÆ.—Tribe OPUNTIEÆ.

RHIPSALIS, *Gærtn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 850; *Engl. & Prantl Pflanzenf.* vol. iii. 6A, p. 197.

Rhipsalis dissimilis, *K. Schum.* var. **setulosa,** *Weber in Rev. Hort.* 1892, p. 428; *K. Schum. Gesamtb. der Kakt.* p. 647; ab typo perianthii segmentis numerosioribus exterioribus luteolis pallide brunneo-tinctis et staminibus 80 vel ultra differt.

Planta succulenta, ramosa, 1–1½ ped. alta. *Caules* biformes, furcati vel verticillatim ramosi; rami 3–6 poll. longi, 3–4 lin. crassi, teretes vel 4–5 angulati, lateribus planis vel sulcatis, nunc glabri nunc ad areolas setuliferi. *Flores* solitarii, ¾ poll. diam., luteo-albi, extra leviter brunneo-tincti. *Ovarium* immersum. *Perianthii* segmenta oblonga, obtusa, patula. *Stamina* 80 vel ultra, alba.—*Rhipsalis setulosa,* Weber in Rev. Hort. 1892, p. 628.

Rhipsalis is the only genus of the *Cactaceæ* of which indigenous species occur outside of the American continent and adjacent islands, for the species of *Opuntia* found in various parts of the Old World have been introduced from America. But two species of *Rhipsalis* are natives of Tropical Africa, and three others are indigenous to the Mascarene Islands. No other genus in the order is so variable in the form of its stems and branches, as may easily be seen by comparing some of the species which have been figured in this Magazine, such as *R. mesembrianthemoides* (t. 3078), *R. Cassytha* (t. 3080), *R. salicornoides* (t. 2461), *R. Mittleri* (figured as *Lepismium Myosurus*, t. 3755), and *R. Houlletii* (t. 6089). Besides such distinct variation in different species, some also produce upon the same individual two distinct kinds of branches, as in the plant here figured, and another example of the same nature will be found represented in the figure of *R. salicornoides* (t. 2461).

The plant here figured was presented to Kew in 1899 by Mr. Justus Corderoy, of Blewbury, near Didcot, an ardent lover and very successful cultivator of succulent plants, who also presented to Kew *R. Houlletii* (t. 6089),

which was the last species of the genus figured in this work, now thirty years ago.

According to Dr. Schumann and Dr. Weber, the variety *setulosa* differs from typical *R. dissimilis* in having five-angled instead of three- to seven-angled stems, and in the outer segments of the flower being straw-coloured instead of bright purple, but besides these characters, according to the figure of *R. dissimilis* in the *Gartenflora*, vol. xl. p. 634, t. 121, the flowers also differ in having more numerous and more obtuse perianth segments, and at least three times as many stamens as in typical *R. dissimilis*. It is a native of the province of Sâo Paulo, Brazil, and was introduced into the Jardin des Plantes, Paris, in 1883.

Descr.—Plant a foot to one and a half high, producing two kinds of stems and branches. *Stems* clustered at the base, forked or verticillately branched; branches three to six inches long, three to four lines thick, usually five- or occasionally four-angled, or subterete; angles obtuse with flat or grooved faces between them; some branches entirely glabrous, others beset at the areoles with tufts of thirteen to twenty erect, and somewhat adpressed, slender, white bristles, one-eighth to one-third of an inch long, having at their base a minute, transverse, rounded scale or rudimentary leaf, and some very minute, woolly hairs, green, not glaucous, with a purple-brown spot at each areole. *Flowers* solitary, three-quarters of an inch in diameter; ovary shortly obconic, glabrous, immersed at the areoles among woolly hairs in cavities of the stem; outer segments two to three lines long, about one line and a half broad, oblong, obtuse, straw-yellow, tinged with brownish; inner segments about five lines long, and two lines broad, oblong, obtuse, spreading, pale yellowish-white or tinted with reddish-brown at the tips on the back; stamens eighty or more; filaments and anthers white; style with three or four linear stigmas, white.—N. E. Brown.

Figs. 1 and 2, areoles and tufts of bristles; 3, apex of style with stigmas:— *all enlarged.*

M. S. del, J. N. Fitch lith

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Tab. 8014.

LISTROSTACHYS BIDENS.

West Tropical Africa.

Orchidaceæ. Tribe Vandeæ.

Listrostachys, *Reichb. f.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 583, sub Angræco; *Pfitzer in Engl. & Prantl Pflanzenf.* vol. ii. 6, p. 215.

Listrostachys bidens, *Rolfe in Thiselton-Dyer Fl. Trop. Afr.* vol. vii. p. 160; inter species caulibus elongatis et floribus parvis, labello sursum attenuato apice breviter tridentato distincta.

Frutex in arboribus epiphyticus. *Caules* elongati, teretes, circiter 2–4 lin. diametro, internodiis quam foliis brevioribus. *Folia* numerosa, disticha, semiamplexicaulia, crassa, coriacea, glabra, ovato-oblonga, 2–2½ poll. longa, ¾ to 1¼ lata, apice oblique bilobata, lobis obtusis, basi constricta, constrictione brevi, circiter 20-nervia. *Flores* suaveolentes, circiter semipollicares, incarnati, in racemos extra-axillares graciles pendentes dispositi, subsessiles; bracteæ parvæ, squamiformes. *Sepala* ovata, obtusa. *Petala* sepalis similia sed minora. *Labellum* subcordiforme, apice breviter tridentatum, supra dentem curvato ad calcaris ostium spectante instructum. *Calcar* labellum æquans. *Pollinia* 2, stipitibus 2 distinctis affixa, glandula simplice squamiformi.—*Limodorum bidens*, Afz. ex Sw. in Vet. Acad. Handl. Stockh. 1800, p. 423 (nomen tantum); Pers. Syn. vol. ii. p. 521.

Tropical Africa is by no means so rich as India in the number and splendour of her known orchids, but recent explorations have greatly increased the number. Nine genera alone contribute upwards of 500 species:—*Bulbophyllum*, 41; *Eulophia*, 65; *Lissochilus*, 83; *Polystachya*, 74; *Angræcum*, 48; *Listrostachys*, 52; *Habenaria*, 107; *Satyrium*, 33; and *Disa*, 20. Some of these are very handsome, but they pale before the Asiatic *Vandæ* and *Dendrobia*.

Listrostachys was separated from *Angræcum* by Reichenbach, and founded on *A. pertusum*, Lindl. (B. M. t. 4782); but he, as usual, did not explain the application of the name, and it is not obvious. The Greek "listron" is described as an instrument for levelling roads—a shovel or roller! We can only suppose that it was in reference to the flowers of *L. pertusa* being arranged like the teeth of a rake, for which "listron" is also given as the equivalent. In *Angræcum*, as distinguished from *Listrostachys*, the pollinia are in pairs on a simple stalk. *A. caudatum*, Lindl. (B. M. t. 4370), and *A. chailluanum*, Hook. f. (t. 5589) belong to the latter genus. The allied genus

Mystacidium differs in having the two distinct pollinia on distinct stalks attached to distinct glands. *Angræcum distichum*, Lindl. (t. 4145) is *Mystacidium distichum*, Benth.

Listrostachys bidens is a very free-growing and profuse-flowering orchid, and its fragrant flowers are pretty, though not brilliantly coloured. The plant from which the drawing was made was sent to Kew, from Old Calabar, in 1899, by Mr. J. H. Holland, then Curator of the Botanic Gardens there, now Assistant in the Museums at Kew. The recurved tooth over the entrance to the spur is a character this species possesses in common with *L. ashantensis*, Reichb. f., and *L. monodon*, Reichb. f. Like the appendage over the spur in *Cleisostoma*, it must impede, to some extent, the visits of insects. Some of the species of this group require revision, and *L. ashantensis* is very near the present; but Lindley's drawing represents the sepals, petals and labellum as crenulate, and the apex of the labellum as less decidedly three-lobed.

Afzelius's specific name refers to the leaves, and was only specially applicable to this species because he referred it to *Limodorum*.

Descr.—Epiphytical on trees. *Stems* elongated, many-leaved, about a quarter of an inch in diameter; internodes shorter than the leaves. *Leaves* numerous, thick, ovate-oblong, between two and three inches long, obliquely two-lobed, lobes obtuse. *Flowers* sweet-scented, about half an inch long, numerous, in slender, pendent racemes. *Sepals* ovate, acute. *Petals* similar, but smaller. *Lip* heart-shaped, shortly three-toothed at the tip, and furnished with a recurved appendage over the entrance to the spur. *Spur* as long as the lip.—W. Botting Hemsley.

Fig. 1, a flower; 2, column and longitudinal section of the lip showing the spur and the appendage over its mouth; 3, anther-cap; 4, pollinia:—*all enlarged.*

M.S del.J.N Fitch lith

Vincent Brooks, Day & Son Lt.d Imp

Tab. 8015.

COLCHICUM libanoticum.

Syria.

Liliaceæ. Tribe Colchiceæ.

Colchicum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 821; *Baker in Journ. Linn. Soc.* vol. xvii. p. 423; *Engl. und Prantl, Pflanzenf.* vol. ii. 5, p. 29.

Colchicum libanoticum, *Ehrenb. ex Boiss. Fl. Orient.* vol. v. p. 166; *Post, Fl. Syria*, p. 809; *C. montano*, Linn., proximum, foliis latioribus antherisque luteis differt.

Cormus subglobosus vel ovoideus, tunicis fuscis, levibus. *Folia* per anthesin perianthii tubo dimidio breviora, late lanceolata, 1 poll. lata, apice paullo cucullata. *Flores* 2–8 albi vel dilute rosei. *Perianthii* tubus 4½ poll. longus, cylindricus vel apice leviter dilatatus; segmenta elliptico-oblonga, obtusa vel acuta, 8–10-nervata, 14 lin. longa, 4½ lin. lata. *Stamina* perianthii segmentis dimidio breviora; filamenta subulata, basi viridia, supra alba; antheræ luteæ. *Styli* rami lineares, virides, stamina paullo superantes.

The home of this plant is in close proximity to snow-drifts at Sunnin on Mount Lebanon, where it flowers in June, bearing, according to Dr. Post, from two to four blossoms. At Kew the plant has flowered in the Alpine House during December and January. Under the treatment received there it has become more robust, and produced a greater number of flowers than in the wild state. The variation in colour of the perianth from pure white to pale rose is also very noticeable in plants raised from the same batch of corms received from Mr. Georg Egger of Jaffa.

The nearest ally of the present plant is *C. montanum*, Linn. (B. M. t. 6443), which has dark brown anthers, narrower leaves, and the tunics of the bulb much produced. *C. Troodi*, Kotschy (t. 6901), has the flowers clustered as in *C. libanoticum*, but they appear in the autumn, while the leaves do not mature until the following spring.

Descr.—*Corm* subglobose or ovoid; tunics dark brown, smooth, shortly produced at the apex. *Leaves* not quite half as long as the perianth-tube at the time of flowering, broadly lanceolate, one inch wide, slightly cucullate at the apex. *Flowers* two to eight on each plant, white or pale

rose. *Perianth-tube* cylindrical or slightly widened at the apex, four and a half inches long; segments elliptic-oblong, obtuse or acute, eight- to ten-nerved, fourteen lines long, four and a half lines wide. *Stamens* half as long as the perianth-segments; filaments subulate, green at the base, white above; anthers yellow. *Style-arms* linear, green, slightly overtopping the stamens.—C. H. Wright.

Figs. 1 and 2, anthers:—*enlarged.*

M.S. del. J.N. Fitch lith

Vincent Brooks Day & Son Ltd Imp.

L. Reeve & Co. London

Tab. 8016.

HIPPOPHAË RHAMNOIDES.

Temperate Europe and Asia.

ELÆAGNACEÆ.

HIPPOPHAË, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 204.

Hippophaë rhamnoides, *Linn.*; *Loudon, Arb. et Frut. Brit.* vol. iii. p. 1324; ab *H. salicifolia,* Don, foliis subtus non tomentosis recedit.

Frutex vel arbor parva, saliciformis, dioica, spinosa, ramis rigidis foliis perianthiisque dense lepidotis, lepidibus orbicularibus peltatis margine fimbriolatis. *Folia* alterna, conferta, lineari-lanceolata, 1–2 poll. longa, subtus argentea. *Flores* minutissimi, lepidoti, utriusque sexus ad axillas bractearum deciduarum solitarii. *Flores masculi* in spicas deciduas dispositi; perianthium diphyllum, valvatum; stamina 4, inclusa, filamentis brevissimis. *Flores feminei* in racemos abbreviatos dispositi; racemi axis in ramum foliatum, apice spinosum excrescens; perianthium tubulosum, supra ovarium constrictum, fructiferum carnosum, nucem fovens, stylo longe exserto per totam fere longitudinem stigmatoso. *Fructus* baccatus, rubro-aurantiacus, monospermus. *Semen* exalbuminosum.

The Sea Buckthorn has been figured in numerous publications, but it has hardly received the recognition it deserves as an ornamental shrub in winter. Though naturally an inhabitant of the sea-shore and salt marshes, it flourishes where there is no accumulation of salt. The profusion of its orange-red berries, which are not taken by birds, in ordinary seasons, at least, and their persistence through the winter, entitle this shrub to a place even in a small garden. At Kew it succeeds remarkably well, both near the water and in the sandy soil of the Arboretum. Intending planters should bear in mind that the berries and male flowers are borne on different individuals, or there may be disappointment, as there often is with hollies. Propagation is usually from suckers or by layering, so there is no difficulty in obtaining a preponderance of female plants. On sandy sea-shores the Sea Buckthorn is often of procumbent habit, and not more than two or three feet high. In more favourable localities, and left to itself, it forms thickets six to eight feet high, and if kept to a single stem it grows much higher.

The largest specimens of *Hippophaë* at Kew at the present time are growing in the beds between King William's Temple and the Temperate House. First comes

H. rhamnoides, var. *taurica*, twenty-one feet high, with a trunk fourteen inches in girth. Further on is a tree of *H. salicifolia*, from thirty-five to forty feet high, spreading twenty-five feet, with a trunk four feet three inches in girth, at two feet from the ground. Nearer the Temperate House is a solitary example of ordinary *H. rhamnoides*. It is fourteen feet high with a spread of twelve feet, and a trunk seventeen inches in girth.

Buckthorn has been used to bind shifting sands, and protect the seeds of the *Pinus Pinaster* sown under it.

Loudon figures a variety *angustifolia* (*op. sup. cit.* vol. vii. t. 174a) with pendulous branches, which he designates a highly ornamental tree. Both male and female of this variety existed in the gardens of the Horticultural Society of London.

Our drawing was made from a specimen taken from the group by the pond near the Palm House.

Descr.—A shrub or small tree clothed in all the young parts with peltate, fringed, silvery or brown scales, diœcious, spiny. *Branches* very rigid, often ending in a spine. *Leaves* alternate, crowded. *Flowers* very small, both sexes solitary in the axils of deciduous bracts. *Male flowers* in deciduous spikes; perianth two-leaved, including four stamens with very short filaments. *Female flowers* in short racemes, the axes of which grow out into spine-tipped branchlets; perianth tubular, enclosing the ovary, becoming fleshy in fruit; style exserted. *Berries* orange-red, ovoid, four or five lines long.—W. Botting Hemsley.

Figs. 1 and 2, male flowers; 3, the same laid open showing the stamens; 4, a female flower; 5, gynæceum; 6, a fruit; 7, scales from the same; 8, a fruit, from which part of the succulent perianth has been removed; 9, a seed; 10, the same in section showing one cotyledon of the embryo, the radicle and the small plumule:—*all enlarged except fig.* 1, *which is natural size.*

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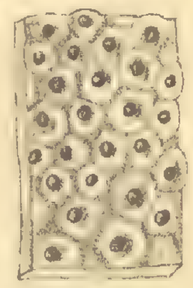

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M. Nadel. & N. Vin. & lith.

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Tab. 8017.

NEPENTHES Rajah.

Borneo.

Nepenthaceæ.

Nepenthes, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 115.

Nepenthes Rajah, *Hook. f. in Trans. Linn. Soc.* vol. xxii. (1859), p. 421, t. 72; *DC. Prodr.* vol. xvii. p. 95; *Burbidge, The Gardens of the Sun,* pp. 100 et 108; *H. J. Veitch in Journ. Roy. Hort. Soc.* vol. xxi. (1897) p. 232; *Gard. Chron.* 1881, vol. ii. p. 493, f. 91; **species ascidiorum magnitudine ac colore insignis.**

Frutex terrestris, paucipedalis, novellis plus minusve ferrugineo-hirsutis, caule subsimplice dense foliato. *Folia* crassissima, coriacea, maxima in plantis agrestibus cum ascidio usque ad operculi apicem 5–6-pedalia: nempe petiolus 4 poll., lamina 20 poll., cirrhus 20 poll., ascidium 12 poll., operculum 10 poll. longum; maxima in plantis cultis saltem dimidio minora, cito glabrescentia, lanceolato-spathulata, deorsum attenuata, apice rotundata utrinque glandulis (rudimentariis?) minutis crebre conspersa. *Cirrhus* circiter 1 poll. infra laminæ apicem peltatim exiens, $\frac{1}{4}$–$\frac{1}{8}$ poll. diametro, per totam longitudinem, sed præcipue apicem versus, glandulis perithecioideis melliferis $1\frac{1}{2}$–3 lin. longis præditus. *Ascidia* oblique lateque ampullacea, primum ferrugineo-pubescentia, extus plerumque brunneo-purpurea, oblique costata, alis duabus anticis viridibus ciliatis ornata, costa postica infra operculi insertionem in calcar recurvum producta; extus glandulis melliferis paucis peritheciodeis oblongis instructa; intus super totam superficiem glandulosa; glandulæ in parte superiore minores, semiobtectæ, segregatæ, in parte inferiore majores, omnino detectæ, infimæ contiguæ, 5–7-gonæ, marginatæ. *Operculum* crassum, amplum, ellipticum, basi cordatum, apice emarginatum, erecto-incurvum, extus rubro-viride, intus viride, rubro-striatum, costa basin versus geniculatim producta. *Os* obliquum, in collum brevem pectinatum intus sanguineum productum. *Peristomium* atro-sanguineum, latum, eversum, lobatum, crebre transverse plicatum, plicis angustis rigidis nitidis, margine interiore pectinatum, dentibus acutis, inter dentes uniporosum, uniglandulosum, glandulis omnino immersis. *Flores* ferrugineo-pubescentes, 4–5 lin. diametro, anguste racemoso-paniculati; paniculæ erectæ, ferrugineo-pubescentes, cum rhachi valida nuda usque ad $2\frac{1}{2}$ ped. longæ, masculinæ quam femineæ longiores; pedunculi graciles, sæpissime biflori, inferiores $\frac{1}{2}$–1 poll. longi, sursum gradatim breviores; pedicelli graciles, longiores vix semipollicares. *Perianthium* utriusque sexus 4-partitum; segmenta crassa, coriacea, oblongo-spathulata, rotundata, recurva, infra ferrugineo-pubescentia, supra glandulosa, persistentia. *Antheræ* uniseriatæ. *Capsulæ* ferrugineo-tomentosæ, circiter 9 lin. longæ.

Nepenthes Rajah was discovered by Sir Hugh Low, whose death we have to lament while these pages were in the printers' hands, together with *N. edwardsiana*, *N. Lowii* and *N. villosa*, in 1851, and was described by Sir Joseph Hooker in 1859. Mr. F. W. Burbidge introduced it for Messrs. James Veitch & Sons in 1881. This firm had it in

cultivation from 1882, but Mr. F. W. Moore, to whom we are indebted for the specimen figured, is the only grower who has really succeeded. He writes:—"The Glasnevin plant is one of three seedlings which were presented to me from Messrs. Veitch's original importation. Two were given me by Messrs. Veitch, and one by Mr. F. W. Burbidge. It is the last that now survives. I was advised to treat them hot and moist, but they did not grow to my satisfaction, so I put my last plant into a cool orchid house, and it immediately began to grow. It has remained there ever since. The plant grew rather tall, so I determined to try and root the head of it, but failed in consequence of trying to force it. The old stem gave me a break at the bottom, and this is the plant I now have. It was two feet high when I cut the pitcher sent to you. My plant has never flowered; but it is still in perfect health, and is forming young pitchers. The secret of growing it seems to me to be moisture, shade and intermediate temperature. The leaves quickly get discoloured and sick when exposed to the sun."

When reading a paper before the Royal Horticultural Society in 1897 Mr. Harry Veitch exhibited a pitcher of *N. Rajah*, also grown by Mr. Moore. This was presented to Kew, and modelled by Mrs. Blackman, for the Museum. It is about double the size of the one represented in our plate. From the point of attachment to the stem to the tip of the lid it measures three feet three inches.

Descr.—A terrestrial shrub about four feet high, rusty-pubescent in nearly all young parts. *Stem* erect, stout, densely leafy. *Leaves* thick, leathery, oblong or lanceolate, including tendril and pitcher, between five and six feet long in wild plants, rarely half as much under cultivation. *Pitchers* sometimes having a capacity of two quarts (the one figured only about half a pint) about half as wide as long, interior wholly glandular; wings fringed. *Collar* very broad, transversely plaited, outer margin lobed, inner margin pectinate. *Lid* as large as the mouth, oval, cordate at the base.—W. Botting Hemsley.

Fig. 1, a portion of the inner surface of pitcher showing digestive glands; 2, a portion of the toothed inner margin of the collar showing the pores between the teeth leading to immersed honey-glands, with one gland exposed; 3, a portion of the under surface of the lid studded with perithecioid honey-glands; 4, male, and 5, female flowers from a wild specimen:—*all enlarged*.

M.S. del. J.N. Fitch Lith.

Vincent Brooks, Day & Son Lt.d Imp.

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Tab. 8018.

ERICA lusitanica.

Western Europe.

Ericaceæ. Tribe Ericeæ.

Erica, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 590.

Erica lusitanica, *Rudolph in Schrad. Journ.* vol. ii. (1799), p. 286; *Coste, Flore Descr. et Illustr. de la France,* vol. ii. p. 513; *Bean in Gard. Chron.* 1904, vol. i. pp. 84 et 91, f. 41; ab *E. arborea,* Linn., ramis pilis simplicibus vestitis, foliis tenuioribus longioribus, pedicellis brevioribus, calycis brevioris dentibus acutis, et corollæ majoris dentibus quam tubo quadruplo brevioribus differt.—*E. polytrichifolia,* Salisb. in Trans. Linn. Soc. vol. vi. (1802), p. 329; *E. codonodes,* Lindl. in Bot. Reg. vol. xx. (1835), t. 1698; Gard. Chron. 1877, p. 463, f. 70, et 1896, vol. i. p. 487, f. 74.

This valuable winter-flowering shrub was introduced prior to 1835, when Lindley published it as a new species. He did not identify it with *E. polytrichifolia,* Salisb., with which he compared it, but suggested that it might be a variety of *E. arborea,* L., differing in having a very small stigma.

Lindley obtained his specimens from Wm. Wood, Nurseryman, of Maresfield, Sussex, where it was reported to be quite hardy, ten to twelve feet high, and beginning to flower in February, and continuing on to May. It does not appear to have become very widely known. It was in cultivation at Kew between 1843 and 1853, when A. Williamson, then Curator of the "Royal Pleasure Grounds," collected it. The variety was inferior to the one now cultivated at Kew, and the name *polytrichifolia,* by which it was known, was peculiarly appropriate. The same variety existed at Kew in 1856, when a specimen was preserved for the Herbarium. In 1877 the present form was figured in the *Gardeners' Chronicle,* and its merits described. In 1888 Kew procured living plants from the Lisbon Botanic Garden, and these flourished and passed unscathed through the excessively cold winter of 1890-91, but succumbed in 1895. There are flowering specimens in the Herbarium collected in the months of March and October, 1891. Last season it was very much blackened and damaged at Kew by the fogs at the beginning of the year.

June 1st, 1905.

An interesting fact in the history of this species is its naturalization at Lytchett Heath, near Poole, by Lord Eustace Cecil. It is fully established, and spreading rapidly. Photographs sent to Kew in March, 1901, represent large clumps in full blossom. The Hon. Mrs. Evelyn Cecil, who took the photographs, has kindly furnished the following particulars of its introduction to Lytchett:—"Two plants were bought by Lord Eustace Cecil for Lytchett Heath, about 1876. One was planted in the garden, and died after several years. The other was planted in rough ground just outside the flower garden and grew well. It began to produce seed about 1880, and since that date it has gone on increasing and seeding. Seedlings that have been transplanted into the grounds near have equally established themselves. Now between one and two acres of ground are covered with thousands of bushes. The average height is from four to six feet, but many are over seven and eight, and one measures eleven feet. It seems to grow equally well in sand or clay. It is a curious fact that although seedlings from Lytchett have been planted in many places in the neighbourhood, and have grown, none have, as yet, seeded, even on similar soil within a few miles. The original plant lived about twenty-five years."

Descr.—An erect, densely-branched shrub, ten to twelve feet high, flowering when quite small, and flowering from the ground to the tips of the topmost branches when fully grown. *Branches* very slender, clothed with simple hairs. *Leaves* linear, about a quarter of an inch long, with a longitudinal, very narrow furrow on the under side. *Pedicels* scarcely as long as the flowers. *Flowers* white or pink. *Calyx-lobes* ovate, acute, one-twenty-fourth of an inch long. *Corolla* tubular-campanulate, about one-sixth of an inch long; teeth obtuse, about a quarter the length of the tube. *Stamens* included; anthers furnished with two hairy awns at the base. *Style* shortly exserted.—W. Botting Hemsley.

Fig. 1, a flower and its bracteolate pedicel; 2, stamens; 3, part of calyx and pistil; 4, cross section of an ovary:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks Day & Son Lith.

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Tab. 8019.

RHABDOTHAMNUS Solandri.

New Zealand.

Gesneraceæ. Tribe Cyrtandreæ.

Rhabdothamnus, *A. Cunn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1011.

Rhabdothamnus Solandri, *A. Cunn. in Ann. Nat. Hist.* vol. i. (1838), p. 460; *Hook. f. Fl. Nov. Zel.* vol. i. p. 186; *C. B. Clarke in DC. Monogr. Phaner.* vol. v. p. 166, t. 17; *Ic. Sel. Hort. Then.* vol. v. p. 57, t. 174 (species unica).

Frutex virgatus, debilis, ramosissimus, 1–3-pedalis, hispidulus, ramis gracillimis divaricatis. *Folia* opposita, sæpe disparia, petiolata, tenuia, ovalia vel orbicularia, maxima cum petiolo gracili circiter pollicaria, sed plerumque minora, grosse dentata; venæ primariæ utrinque 3 vel 4, subtus elevatæ, venis ultimis minute reticulatis. *Flores* axillares, solitarii, suberecti, circiter 1 poll. longi; pedicelli graciles, nunc quam flores paullo longiores, nunc breviores, nudi vel interdum bracteolis 2 minutis medio instructi. *Calyx* æqualiter 5-fidus, hispidulus; lobis lanceolatis acutis tubo longioribus. *Corolla* glabra, rubro-aurantiaca, longitudinaliter rubro-striata, infundibuliformis; limbus circiter 1 poll. diametro, bilabiatus, labio postico minore emarginato, labio antico æqualiter 3-lobato, lobis omnibus rotundatis. *Stamina* 4, didynamia, longiora vix exserta. *Ovarium* superum, glabrum, 1-loculare, stylo incluso; placentæ parietales, bifidæ, multiovulatæ. *Capsula* crustacea, ovoidea, acuta, calycem persistentem paullo excedens, demum in valvas 4 dehiscens. *Semina* minuta, lævia, obscure striatula.—*R. scabrosus*, Steud. Nomencl. ed. 2, vol. ii. (1841), p. 443.

Rhabdothamnus Solandri is the only representative of the *Gesneraceæ* inhabiting New Zealand, where it is endemic and confined to the Northern Island, ranging from the Bay of Islands southward to Wellington. Sir Joseph Hooker states that it was then (1854) in cultivation in England; but we think he must have had the Australian closely allied *Fieldia australis*, A. Cunn. (B. M. t. 5089) in view, because we find no other record of its existence in gardens in the United Kingdom.

Kew possesses a plant, purchased last year of Mr. Lemoine, nurseryman of Nancy; but, like many other plants at Kew, it suffered from the destructive fogs of the autumn and winter. In Mr. W. E. Gumbleton's garden at Belmore, Queenstown, Ireland, it has flourished, and we are indebted to him for materials for our figure. He obtained it from the same source as Kew, and kept it in a greenhouse, where it had been almost continuously in

flower from November to the end of January. The plant was then "growing strongly, and will probably flower on all the branchlets of this young growth during the summer and autumn." The individual flowers last for a week or ten days before falling. The plant has since fruited with Mr. Gumbleton.

Descr.—A much-branched, hispid shrub, one to three feet high. *Branches* very slender, given off at right angles. *Leaves* opposite, often in unequal pairs, petiolate, thin, oval or orbicular, the largest, including slender petiole, about an inch long, coarsely toothed; ultimate veins finely reticulated. *Flowers* axillary, solitary, about an inch long; pedicels slender, about as long as the flowers. *Calyx* hispid, equally five-lobed; lobes lanceolate, acute, longer than the tube. *Corolla* glabrous, orange, longitudinally striped with red; limb two-lipped; upper lip smaller, emarginate; lower lip deeply three-lobed; all the lobes rounded. *Stamens* four, the two longer ones scarcely exserted. *Capsule* ovoid, acute, slightly overtopping the persistent calyx. *Seeds* minute.—W. Botting Hemsley.

Fig. 1, part of calyx and pistil; 2, corolla laid open; 3 and 4, front and back views of stamen; 5, cross section of ovary; 6, capsule from a dried specimen:—*all except the last enlarged.*

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M.S. del. J.N. Fitch, lith.

Vincent Brooks Day & Son Lith.

Tab. 8020.

LYCASTE Locusta.

Peru.

Orchidaceæ.—Tribe Vandeæ.

Lycaste, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 547; *Pfitzer in Engl. & Prantl Pflanzenf.* vol. ii. 6, p. 162.

Lycaste Locusta, *Reichb. f. in Gard. Chron.* 1879, vol. i. 524; *Rolfe in Orch. Rev.* 1898, p. 136; aff. *L. costatæ*, Lindl., scapis longioribus, floribus omnino viridibus, sepalis petalisque angustioribus, et labelli apice fimbriato distincta.

Herba epiphytica, circa 2 ped. alta. *Pseudobulbi* cæspitosi, ovoideo-oblongi, subcompressi, $2\frac{1}{2}$–4 ped. alti, monophylli, vaginis membranaceis vestiti. *Folia* elongato-lanceolata, acuminata, longe petiolata, plicata, circa $1\frac{3}{4}$ ped. longa, $1\frac{1}{2}$ poll. lata, viridia. *Scapi* circa 10-poll. alta, vaginis oblongo-lanceolatis acuminatis 15–18 lin. longis vestiti. *Bracteæ* oblongo-lanceolatæ, acuminatæ, $1\frac{3}{4}$ poll. longæ. *Pedicelli* circa 1 poll. longi. *Flores* speciosi, virides, labello albo-marginato. *Sepala* circa 2 poll. longa; sepalum posticum lanceolato-ellipticum, subacutum vel apiculatum, concavum, circa 9 lin. latum; sepala lateralia triangulari-lanceolata, basi fere 1 poll. lata. *Petala* oblonga, subobtusa, $1\frac{3}{4}$ poll. longa, 5 lin. lata. *Labellum* trilobum, circa 2 poll. longum; lobus intermedius elliptico-oblongus, obtusus, valide fimbriatus, fere 1 poll. latus; lobi laterales triangulares, acuti, subfalcati, 3 poll. longi, margine integro; crista obcordato-oblonga, margine elevata et crenulata, medio concava, carinis ad basin extensis. *Columna* clavata, arcuata, circa 1 poll. longa, apice anguste alata, basi in pedem curvatum extensa, cum sepalis lateralibus mentum latum obtusum formans; pollinarii glandula utrinque appendicula furcata ornata.

The species of *Lycaste* having a fimbriate lip form a particularly difficult group, and have never been properly defined. A few of them, however, are very well known, and among these may be mentioned four which have been figured in the Botanical Magazine. The earliest is *L. fulvescens*, Hook. (t. 4193), having rather narrow, buff-yellow segments. *L. gigantea*, Lindl. (t. 5616) has larger greenish sepals and petals, and a brick-red lip margined with deep yellow. *L. costata*, Lindl., is figured under the name of *L. Barringtoniæ var. grandiflora*, Hook. f. (t. 5706), and has ivory-white flowers; while *L. linguella*, Reichb. f. (t. 6303) has rather greener flowers, and a less fimbriate lip than the preceding. The present one is remarkable for its dull green flowers, with a white fringe, which extends all round the front of the lip. It was originally described over twenty-five years ago, from a plant collected in Peru by Mr. Davis, in the service of Messrs.

James Veitch & Sons, who flowered it first at Chelsea, in 1879, after which it appears to have been lost sight of. It was reintroduced from Peru by Messrs. F. Sander & Co., and flowered at Glasnevin in April, 1898, when it was identified. The plant figured was presented to Kew by Mr. F. W. Moore, A.L.S., Keeper of the Royal Botanic Gardens, Glasnevin, in 1903, and it flowered in the Temperate Orchid House in April of last year.

Descr.—A tufted epiphyte about two feet high. *Bulbs* ovoid-oblong, somewhat compressed, about two and a half to four inches high, one-leaved, partially clothed with the persistent leaf-sheaths. *Leaves* elongate-lanceolate, acuminate, narrowed into a long petiole, plicate, about twenty-two inches long, one inch and a half broad, bright green. *Scapes* about ten inches high, bearing oblong-lanceolate, acuminate sheaths about fifteen to eighteen lines long. *Bracts* oblong-lanceolate, acuminate, one inch and three-quarters long. *Pedicels* over an inch long. *Flowers* large, dull green, with a white margin to the lip. *Sepals* about two inches long; dorsal lanceolate-elliptical, subacute or apiculate, concave, about nine lines broad; lateral triangular-lanceolate, nearly an inch broad at the base. *Petals* oblong, subobtuse, one inch and three-quarters long, five lines broad. *Lip* three-lobed, about two inches long; front lobe elliptical-oblong, obtuse, strongly fimbriate, nearly an inch broad; side lobes triangular, acute, slightly falcate, three lines long, with entire margin; crest obcordate-oblong, with a crenulate, fleshy, raised margin, extending to the base as a pair of keels, concave in the centre. *Column* clavate, arcuate, over an inch long, narrowly winged at the apex; base prolonged into a curved foot three-quarters of an inch long, forming with the bases of the lateral sepals a broad, obtuse chin; stipes of pollinia oblong; gland bearing a slender, furcate appendage at each side.—R. A. Rolfe.

Fig. 1, column; 2 and 3, pollinarium, seen from front and back, and showing the lateral furcate appendages:—*all enlarged*.

M.S. del. J.N.Fitch lith.

Vincent Brooks Day & Son Lt.d Imp.

L.Reeve & Co. London.

Tab. 8021.

BOWKERIA gerrardiana.

Natal.

Scrophulariaceæ. Tribe Cheloneæ.

Bowkeria, *Harv.; Benth. et Hook. f. Gen. Plant.* vol. ii. p. 937.

Bowkeria gerrardiana, *Harv. ex Hiern in Thiselton-Dyer, Fl. Cap.* vol. iv. 2, p. 220; a *B. triphylla* corollæ labio postico latissimo et filamentis basi crassioribus anticis breviter obtuseque calcaratis recedit.

Frutex erectus, ramosus, 8–10 ped. altus, ramulis subteretibus foliosis pilis cinereis tenuibus sparse vestitis. *Folia* ternatim verticillata, sessilia, chartacea, elliptico- vel oblongo-lanceolata, 2–6 poll. longa, $\frac{1}{2}$-$1\frac{3}{4}$ poll. lata, acuminata, serrulata, breviter pubescentia vel venis subtus exceptis glabra, subtus resinoso- punctata. *Flores* 3–10 in cymas axillares foliis breviores dispositi. *Pedunculi* 1–2 poll. longi, pubescentes, patentes. *Pedicelli* $2\frac{1}{2}$–7 lin. longi, sursum incrassati. *Bracteæ* et bracteolæ ovato-lanceolatæ vel lanceolatæ, circiter $2\frac{1}{4}$ lin. longæ, caducæ. *Calyx* $\frac{1}{4}$–$\frac{1}{3}$ poll. longus, viscidus; segmenta ovata vel elliptica, inæqualia, sæpissime acuta. *Corolla* 8–9 lin. longa, 6–8 lin. lata, urceolato-globosa, nitida, alba, intus minute rubro-punctata, extra viscida, subcoriacea; labium posticum subplanum, $4\frac{1}{2}$–6 lin. longum, 7–8 lin. latum, latissime bilobatum; anticum brevius, ventricosum, trilobatum, lobis rotundatis circiter 2 lin. longis $1\frac{1}{2}$–2 lin. latis. *Staminum* filamenta basi curvata et incrassata, antica breviter obtuseque calcarata. *Stylus* 3 lin. longus, sursum leviter incrassatus. *Capsula* oblonga, 4–5 lin. longa, nitidula, sæpe 3-locularis.—*B. triphylla*, Hort., non. Harv.; De Wild. Ic. Sel. Hort. Then. vol. ii. p. 143, t. 74; Gard. Chron. 1904, vol. ii. p. 398, cum fig.

Bowkeria is a small genus of shrubby plants inhabiting the eastern region of Cape Colony, and extending northward to Natal and the Transvaal. Most nearly allied to *Ixianthes* and *Scrophularia*, the species resemble in habit, foliage and the shape of the flowers some of the shrubby Calceolarias. Of the five species known, that here figured is the only one in cultivation, assuming that none of the plants grown under the name of *B. triphylla* is correctly designated. Plants bearing this name have been cultivated in the Temperate House, Kew, for many years, but as yet no flowers have been produced, in the absence of which a satisfactory determination of the species cannot be attempted. In foliage *B. gerrardiana* and *B. triphylla* are practically identical. The latter is, however, easily distinguished by the shape of the upper lip of the corolla, being very much narrower. The difference in the bases of the filaments is a less important character.

June 1st, 1905.

The specimen from which the drawing was prepared was sent to Kew by Lord Walsingham, F.R.S., in September, 1904. It was taken from a plant ten feet high, growing out of doors in the garden of Mrs. Gwytherne-Williams, St. Lawrence, Isle of Wight, under the name of *B. triphylla*. The flowers are said to have a peculiar faint odour, or, according to the *Flora Capensis*, are strongly rue-scented.

Descr.—An erect, branched shrub eight to ten feet high, with subterete, leafy branches, thinly covered with grey, slender hairs. *Leaves* ternately verticillate, sessile, chartaceous, elliptic- or oblong-lanceolate, two to six inches long, half an inch to about two inches broad, acuminate, serrulate, shortly pubescent or glabrous, except on the veins beneath, resin-dotted beneath. *Inflorescence* an axillary, dichasial, three- to ten-flowered cyme, shorter than the leaves. *Peduncles* one to two inches long, shortly pubescent, spreading. *Pedicels* two and a half to seven lines long, thickened above. *Bracts* and bracteoles ovate-lanceolate or lanceolate, about two lines long, caducous. *Calyx* three to four lines long, viscid; segments ovate or elliptic, unequal, mostly acute. *Corolla* eight to nine lines long, six to eight lines broad, urceolate-globose, shining-white, minutely red-dotted inside, viscid outside, somewhat leathery; upper lip rather flat, four and a half to six lines long, seven to eight lines broad, very broadly two-lobed; lower lip shorter, ventricose, three-lobed; lobes rounded, about two lines long, one and a half to two lines broad. *Filaments* curved and thickened at the base, those of the lower stamens shortly and obtusely spurred. *Style* about three lines long, thickened at the apex. *Capsule* oblong, four to five lines long, shining, often three-celled.—S. A. Skan.

Fig. 1, vertical section of the calyx, showing pistil; 2, vertical section of the flower; 3 and 4, anthers; 5, transverse section of the ovary:—*all enlarged.*

M.S. del, J.N. Fitch lith.

Vincent Brooks, Day & Son Lith.

L. Reeve & Co. London.

Tab. 8022.

CACALIA TUBEROSA.

North America.

Compositæ. Tribe Senecionideæ.

Cacalia, *Linn.*: *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 449, sub Senecione; *Hoffm. in Engl. & Prantl, Pflanzenf.* vol. iv. 5, p. 296.

Cacalia (§ Conophora) **tuberosa,** *Nutt. Gen. Am. Pl.* vol. ii. p. 138; *A. Gr. Synop. Fl. N. Am.* vol. i. 2, p. 396; *Chapm. Fl. Southern U.S.* p. 224; inter species hujus affinitatis foliis crassissimis radicalibus ovalibus vel oblongis longissime petiolatis conspicue costatis insignis.

Herba perennis, robusta, caulibus pluribus usque ad 6 ped. altis sed sæpius brevioribus, glabra. *Folia* crassa, coriacea, ovata vel lanceolata, valide 7- vel 5-costata, integra vel paucidentata, radicalia longissime petiolata, cum petiolo interdum bipedalia, caulina pauca, sursum gradatim minora. *Capitula* discoidea, numerosa, 5-flora, late corymbosa, pedunculis subumbellatis gracilibus bracteis paucis parvis sparsis instructis. *Involucri bracteæ* 5, oblongæ, circiter semipollicares, obtusæ, erectæ, dorso late alatæ, herbaceæ, virides, ad margines ac carinam scariosæ, albæ. *Corolla* pallide lutea; tubus angustissimus apice inflatus; lobi lineares, acuti. *Antheræ* aurantiacæ.—*Senecio Nuttallii,* Sch. Bip. in Flora, vol. xxviii. p. 499; *Mesadenia tuberosa,* Britton in Britt. & Br. Ill. Fl. N. U. States & Canada, vol. iii. p. 474, f. 4031.

Cacalia tuberosa is a very distinct and striking plant, which one would not take to be a member of the *Compositæ* from its general aspect. The conspicuously winged bracts of the involucre give the flower-heads the appearance of the fruit of some of the *Umbelliferæ*. It is a plant for wet places in the wild garden or mixed border among other big things, as its somewhat coarse habit disqualifies it for association with plants of graceful proportions. It has a hardy constitution, judging from its great latitudinal distribution, ranging, as it does, from the lake region of Canada southward to Florida and Texas. The wild specimens we have seen are all of much smaller dimensions than the cultivated one, for which we are indebted to W. E. Gumbleton, Esq.

Descr.—A robust, perennial herb, glabrous in all parts. *Stems* several, as much as six feet high under cultivation, but usually much less than that in a wild state. *Leaves* thick, leathery, ovate or lanceolate, prominently seven- or five-ribbed longitudinally, entire or few-toothed; radical on very long stalks, including the stalks sometimes two

feet long; stem-leaves gradually smaller upwards. *Flower-heads* discoid, five-flowered, numerous, in broad, compound corymbs. *Peduncles* slender, subumbellate, furnished with a number of small, scale-like bracts. *Involucral bracts* five, oblong, about half an inch long, erect, with a broad wing running down the back, herbaceous, green; margins scarious and wing white. *Corolla* pale yellow. *Anthers* orange.—W. Botting Hemsley.

Fig. 1, section of leaf-stalk; 2, a flower-head; 3, a cross section of the same showing the strongly winged involucral bracts; 4, receptacle and two bracts; 5, a flower; 6, a pappus-bristle; 7, anthers:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks Day & Son Lith. Imp.

I. Reeve & Co. London.

Tab. 8023.

PERNETTYA MUCRONATA
(Varietates diversæ).

South Chili and Patagonia.

Ericaceæ. Tribe Andromedeæ.

Pernettya, *Gaud.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 582.

Pernettya mucronata, *Gaud. in Ann. Sc. Nat.* vol. v. p. 102, in nota; *Hombr. et Jacq. Voy. au Pole Sud, Bot. Phaner. Dicot.* t. 22; *Hook. f. Fl. Antarct.* vol. ii. p. 326; *Gay, Fl. Chil.* vol. iv. p. 354; species variabilis adhuc male circumscripta foliis ovatis vel lanceolatis rigide spinoso-cuspidatis.

Frutex sempervirens, ramosissimus, procumbens vel ascendens, cito glabrescens, ramis rigidis. *Folia* alterna, conferta, crassa, coriacea, oblongo-lanceolata, 3–9 lin. longa, margine recurva, paucidentata. *Flores* axillares, solitarii, pedunculati, circiter 3 lin. longi; pedunculi quam folia breviores, recurvi, infra medium bracteolis 2-4 squamiformibus instructi, puberuli. *Calyx* alte 5-fidus, segmentis ovatis acutis. *Corolla* alba, sæpe roseo tincta, urceolata, 5-dentata, dentibus recurvis. *Stamina* 10, inclusa; filamenta minute puberula, ima basi dilatata; antherarum loculi apice breviter biaristati. *Ovarium* superum, 5-loculare, loculis multiovulatis. *Bacca* globosa, polysperma. *Semina* minuta, compressa, angulata.—*Arbutus mucronatus*, Linn. f.; Bot. Mag. t. 3093 (flores tantum).

Pernettya mucronata was originally raised from seeds sent home by John Anderson to the Edinburgh Botanic Garden, where it flowered for the first time in May, 1830. Ten years later *P. angustifolia*, Lindl. (B. M. t. 3889) flowered in the same garden. With regard to the specific limits of the Chilian *Pernettyæ*, authors have taken very different views. The forms are numerous, and the late Dr. Philippi and others described many of them as species. On the other hand, some botanists and horticulturists regard *P. mucronata* and *P. angustifolia* as mere varieties. But, judging from the type of the latter in the Kew Herbarium, they seem specifically distinct. *P. mucronata*, as we understand it, is itself very variable in stature, in the size and shape of the leaves, as well as in other characters. It will probably be found to inhabit a different area from that of *P. angustifolia*, though the two may overlap to some extent. *P. mucronata* is essentially a southern species, being very common from the Straits of Magellan to Cape Horn, and Sir Joseph Hooker

collected it largely in Hermite Island, in nearly 56° S. lat. Specimens from more northern localities referred to this species require confirmation or verification.

P. angustifolia, Lindl., was first recorded from Valdivia (about 40° S. lat.), and there are several wild specimens in the Kew Herbarium from the same locality. It was in cultivation at Kew between 1843 and 1853, as specimens dried by A. Williamson attest; but it disappeared many years ago, having probably been killed by frost. In 1902 H. J. Elwes, Esq., F.R.S., presented seed to Kew collected by himself at Ensenada, Lake Llanquihue, in about 41° 30′ S. lat., from which a fresh stock has been raised.

In a circular, issued about twenty-five years ago, Mr. L. T. Davis, of Hillsborough, County Down, Ireland, states that he commenced some thirty years previously raising seedlings from "*P. angustifolia*, the hardiest and best, free-fruiting variety of *P. mucronata* then in cultivation." From all the evidence before us, there is little doubt that this was a narrow-leaved variety of the genuine *P. mucronata*, and not the *P. angustifolia*, Lindl. At all events the plant commonly cultivated at the present time under the name of *angustifolia*, is certainly *P. mucronata*.

Under cultivation every part of a plant is liable to variation, and this may be intensified by continued selection. In the case of vegetables grown for the table the root, the stem, the foliage, the inflorescence and the fruit have been in turn moulded to the demand of the cultivator. With decorative plants grown for the gratification of the eye and not of the palate, form and colour in the flowers and foliage have been the objects aimed at. It is singular that *Pernettya mucronata* is, perhaps, the only case at present in which the possibilities of colour-variations in the fruit have been worked upon. Some of the results are indicated in the accompanying plate. There is, perhaps, nothing to put beside them except the not uncommon cases in which under cultivation plants with red fruits sport to yellow as in *Ilex*, *Coffea*, *Cratægus* and *Solanum*.

Descr.—An evergreen, much-branched shrub, one to four feet high under cultivation, young parts soon becoming glabrous. *Branches* thin, rigid. *Leaves* alternate,

crowded, thick, rigid, oblong-lanceolate, three to nine lines long, margin recurved, toothed, sharply spine-tipped. *Flowers* solitary, axillary, about three lines long; stalks shorter than the leaves, furnished with two to four scale-like bracteoles. *Calyx* five-toothed; teeth ovate, acute. *Corolla* white, tinged with rose, urceolate, five-toothed; teeth recurved. *Stamens* ten, included; anthers two-awned at the tip. *Fruit* baccate, globose, about half an inch in diameter, many-seeded, pink, red, purple or white. *Seeds* very small, flattened, angular.—W. Botting Hemsley.

Fig. 1, a flower; 2, a stamen; 3, a pistil:—*all enlarged.*

M. S. del. J.N Fitch lith

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L. Reeve & Co. London

Tab. 8024.

COLEUS shirensis.

British Central Africa.

Labiatæ. Tribe Ocimoideæ.

Coleus, *Lour.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1176; *Engl. & Prantl, Pflanzenf.* vol. iv. 3 A, p. 359.

Coleus shirensis, *Gürke in Engl. Jahrb.* vol. xix. p. 216; *Baker in Thiselton-Dyer, Fl. Trop. Afr.* vol. v. p. 443; ex affinitate *C. thyrsoidei*, Baker, a quo foliis simpliciter dentatis cymis sessilibus et calyce 4-lobo differt.

Herba perennis, radice fibrosa, $2\frac{1}{2}$–3 ped. alta, ramosa, glanduloso-puberula et villosa, caule demum glabro verrucoso. *Rami* acute quadranguli, virentes, purpureo-maculati, demum obtuse-angulati et pallide brunnei. *Folia* longe petiolata, ovata, acuta, basi subtruncata vel subcordata, ad petiolum breviter cuneato-decurrentia, crenato-dentata, rugosa, utrinque minute puberula. *Paniculæ* spiciformes, $\frac{1}{2}$–1 ped. longæ, terminales, verticillastris vel cymis 10–20 compositæ, glanduloso-puberulæ et villosæ. *Pedicelli* 2–6 lin. longi. *Calyx* inæqualiter 4-lobus; lobi majores subæquales, divergentes, $1\frac{1}{4}$ lin. longi, fere 1 lin. lati, oblongi, superiore obtuso, inferiore acute bifido; lobi minores $\frac{2}{3}$ lin. longi, $\frac{1}{4}$ lin. lati, lineari-oblongi, obtusi, omnes in fructu conniventes, accrescentes. *Corolla* 9 lin. longa, violaceo-cœrulea; tubus abrupte deflexus, compressus, apice dilatatus, intra ad flexuram membrana clausus; labium superius subquadratum, inæqualiter 4-lobum; labium inferius compresso-cymbiforme, acutum. *Stamina* corollæ subæqualia; filamenta supra insertionem ad tertiam partem connata. *Stylus* demum corollam breviter excedens.

This fine species of *Coleus* is allied to the handsome *C. thyrsoideus* (B. M. t. 7672), differing in its simply toothed leaves, sessile cymes, the 4-lobed calyx, and the darker blue colour of its flowers. It was sent to Kew in 1902 by Mr. J. McClounie from Zomba, in British Central Africa, a region that appears to be comparatively rich in species of this and the allied genus *Plectranthus*, some of them being quite as ornamental as the present one. As grown at Kew, *Coleus shirensis* becomes a fine bushy plant about three feet high, each branch ending in a long, spike-like panicle of dark blue flowers, and during the present year has lasted in flower from February to April. It requires the same treatment as other species of the genus.

Descr.—A fibrous-rooted, branching herb about three feet high. *Branches* at first sharply four-angled, glandular and hairy, pale green, spotted with purple, becoming glabrous, obtusely angular, verrucose at the spots, and pale brown

in colour. *Leaves* spreading; petiole one to two inches and a half long, glandular and hairy; blade two to four inches and a half long, about two to three inches and a half broad, ovate, acute, subtruncate or subcordate at the base, and shortly decurrent on the petiole, regularly obtusely dentate; veins impressed above and prominent beneath, minutely puberulous beneath, and very indistinctly so on the upper surface, bright green, paler beneath. *Panicle* terminal, spike-like, six inches to a foot long, one and a half to two and a half inches in diameter, composed of from ten to twenty or more verticils which develop into dichotomous cymes bearing ten to fifteen pedicellate flowers; lowest pair of cymes usually pedunculate and the rest sessile, glandular, and hairy. *Pedicels* two to six lines long. *Calyx* hairy, four-lobed; upper and lower lobes subequal, about a line long and broad, divergent, oblong, the upper obtuse, the lower shortly and acutely bifid; lateral lobes two-thirds of a line long, quarter of a line broad, linear-oblong, obtuse; after flowering the lobes close together and enlarge. *Corolla* three-quarters of an inch long, thinly glandular-puberulous, with a few longer hairs on the upper and lower lips and underside of the tube, which is abruptly bent upon itself at the middle, dilated beyond the bend, compressed, nearly closed inside at the bend by a membrane, white, stained with dark blue; upper lips subquadrate, unequally four-lobed; lower lips five lines long, three lines deep, compressed-boat-shaped, acute, deep blue. *Stamens* about equalling the lower lip; filaments connate at the base, white, with blue tips; anthers oblong, violet. *Style* shortly exceeding the corolla, filiform, glabrous, deep orange at the very base, blue at the apex. *Disk* with a large, oblong gland on the lower side.—N. E. Brown.

Fig. 1, calyx and pistil; 2, a corolla laid open; 3 and 4, anthers; 5, ovary and disk:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks Day & Son Lith. Imp.

L. Reeve & Co. London.

Tab. 8025.

COLCHICUM Steveni.

Syria and Arabia.

Liliaceæ. Tribe Colchiceæ.

Colchicum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 821; *Engl. & Prantl, Pflanzenf.* vol. ii. 5, p. 29.

Colchicum Steveni, *Kunth, Enum. Pl.* vol. iv. p. 144, *excl. syn.*; *Baker in Journ. Linn. Soc.* vol. xvii. p. 433; *Boiss. Fl. Orient.* vol. v. p. 165; species *C. montano*, Linn., affinis, antheris luteis oblongo-linearibus differt.

Cormus ovoideus, 1 poll. longus, tunicis brunneis, lævis, collo brevi. *Folia* synanthia, anguste linearia, 3 lin. lata, floribus æquilonga. *Flores* 3–10 fasciculati. *Perianthii* tubus cylindricus, 2½ poll. longus, albus; segmenta anguste elliptica, obtusa, 9 lin. longa, 4 lin. lata, 7–10-nervia, dilute roseo-lilacina demum fere alba. *Stamina* perianthii segmentis multo breviora; filamenta 6 lin. longa, basi incrassata lutea, supra subulata, alba; antheræ lineari-ellipticæ, luteæ. *Styli* rami lineares, albi, staminibus æquilongi.—*C. polyphyllum*, Boiss. et Heldr. Diagn. Pl. Nov. series 2, n. iv. p. 121.

Although this charming species was described as long ago as 1843, it appears not to have been brought into cultivation until quite recently. The plants figured were raised from corms purchased from Mr. G. Egger, of Jaffa, in 1904, and flowered in an unheated greenhouse at Kew in January of the present year. *C. Steveni* belongs to that comparatively small section of the genus characterized by the leaves and flowers being produced at the same time, and the perianth not being tessellated. It is very closely allied to *C. montanum*, Linn. (B. M. t. 6443), with which it has sometimes been confused, but from which it is chiefly distinguished by having yellow, not brownish-purple anthers. By a similar character it differs from *C. Bertolonii*, Stev. (*Reichb. Ic. Fl. Germ.* vol. x. t. 424), as well as by the apical sheath of the corm being usually less produced. *C. Steveni* grows along the coast region of Syria and extends into Arabia, while specimens doubtfully referred to it have been collected in Persia.

Descr.—*Corm* ovoid, one inch long; tunics brown, smooth, produced into a short neck. *Leaves* appearing with, and about as long as, the flowers, narrowly linear, three lines wide. *Flowers* three to ten in a fascicle. *Perianth-tube* cylindrical, two and a half inches long,

white; lobes narrowly elliptical, obtuse, nine lines long four lines wide, seven- to ten-nerved, pale rosy lilac, becoming nearly white. *Stamens* much shorter than the perianth-segments; filaments thickened and yellow at the base, subulate and white above; anthers linear-elliptic, yellow. *Style-branches* linear, white, as long as the stamens.—C. H. Wright.

Figs. 1 and 2, anthers:—*enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 8026.

LISTROSTACHYS Monteiræ.

West Tropical Africa.

Orchidaceæ. Tribe Vandeæ.

Listrostachys, *Reichb. f. in Bot. Zeit.* 1852, p. 930; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 583, sub Angræco.

L. Monteiræ, *Reichb. f. in Linnæa*, vol. xli. p. 76; *Rolfe in Thiselton-Dyer Fl. Trop. Afr.* vol. vii. p. 156; inter species affines foliis latis, racemis foliis sæpissime longioribus et calcare erecto subcurvato distincta.

Herba epiphytica, robusta, 1-2 ped. alta. *Caules* erecti, subcompressi. *Folia* oblonga vel obovato-oblonga, suboblique biloba, obtusa, basi subcuneata, 5–8 poll. longa, 1½–2 poll. lata, coriacea. *Racemi* erecti, ½–1 ped. longi, multiflori. *Bracteæ* late ovatæ, subobtusæ, cucullatæ, 3–4 poll. longæ. *Pedicelli* 6–9 lin. longi. *Flores* flavido-albi, calcare basi virescente apice ochraceo. *Sepala* arcte recurva, basi lata, dein acuminatissima, 5–6 lin. longa. *Petala* sepalis subsimilia, minora. *Labellum* 4–5 lin. longum, basi late ovatum, cucullatum, dein acuminatum, recurvum; calcar erectum, latum, plus minusve curvatum, 1½–2 poll. longum. *Columna* latissima, 1 lin. longa, apice rostrata, acuminata, decurva; pollinarii stipites 2, graciles; glandula lineari-oblonga, apice recurva, apiculata.—*Angræcum antennatum*, Kränzl. in Engl. Jahrb. vol. xvii. p. 61.

Listrostachys bidens, Rolfe, was figured in a recent issue of the Botanical Magazine (t. 8014), where some remarks appear on the genus and on the three other species previously figured. *L. Monteiræ*, Reichb. f., though strikingly different in appearance, agrees in the structure of the very characteristic pollinarium which led to its original separation from *Angræcum*. In other respects the genus is rather polymorphic. Out of about sixty species over fifty are continental, and the remainder Mascarene, so that the genus is essentially African. It is also typically western, as four-fifths of the continental species are only known from West Africa, the remainder being East African, with a single outlying species (*L. arcuata*, Reichb. f.) in extra-tropical South-east Africa. This is occasionally met with in cultivation, and it may be added that about a third of the species have appeared in gardens at different times.

Listrostachys Monteiræ is a common West African species, which was originally described from dried specimens collected at Bembi in Angola by Mrs. Monteiro,

and has since been found in the Cameroons, Lagos and adjacent territory. It was introduced into cultivation by Messrs. F. Sander & Co., who flowered it in March, 1892. The plant figured was sent to Kew in 1900 by Mr. J. H. Holland, then Curator of the Botanic Garden at Old Calabar. It flowers annually in the Tropical Orchid House.

Descr.—A stout, erect epiphyte, one to two feet high, bearing stoutish roots towards the base. *Stems* somewhat compressed. *Leaves* oblong or obovate-oblong, obliquely bilobed and obtuse, cuneate towards the base, five to eight inches long by one and a half to two inches broad, coriaceous and dark green. *Racemes* erect, six to twelve inches long, many-flowered. *Bracts* broadly ovate, obtuse, cucullate, three to four lines long. *Pedicels* six to nine lines long. *Flowers* yellowish white; upper part of spur ochreous, base light green. *Sepals* strongly recurved, very acuminate from a broad base, five to six lines long. *Petals* rather smaller than the sepals, but otherwise similar. *Lip* broadly ovate, cucullate at the base, thence acuminate, recurved, four to five lines long; spur erect, stout, more or less curved, one and a half to two inches long. *Column* very stout, about a line long, with an acuminate, curved beak; stipites of pollinarium two, slender, attached to a linear-oblong gland, apex recurved, apiculate.—R. A. Rolfe.

Fig. 1, column; 2, anther case; 3, pollinarium; 4, entire plant:—1, 2 and 3 *much enlarged*; 4 *much reduced*.

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M.S. del, J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d Imp.

L. Reeve & Co. London.

Tab. 8027.

MECONOPSIS integrifolia.

Western China and Tibet.

Papaveraceæ.

Meconopsis, *Vig.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 52.

Meconopsis integrifolia, *Franch. in Bull. Soc. Bot. Fr.* vol. xxxiii. (1886), p. 389; *Maxim. Fl. Tangut.* p. 35, t. 9, ff. 7–12, t. 23, ff. 22–25, non *Bulley in Flora & Sylva*, vol. iii. (1905), p. 80 cum icone colorata; *Gard. Chron.* 1904, vol. ii. p. 240 cum icone nigra; *Le Jardin*, 1904, p. 328; inter species caulibus plurifloris, columna stylari nulla et florum colore insignis.

Herba sæpius robusta, monocarpica, ½–3 ped. alta, primum tota pilis sericeis longissimis rubiginosis fulvescentibus vel albidis plerumque vestita, demum pro parte glabrescens, sæpius 8–12-flora. *Caulis* validus, plurisulcatus, ramis vel pedunculis ac foliis caulinis in pseudoverticilla dispositis. *Folia* radicalia numerosissima, confertissima, pro maxima parte lineari-lanceolata, usque ad pedem longa, sed sæpius dimidio breviora, caulina similia, sursum gradatim minora, infima minora, ovato-spathulata. *Pedunculi* quam folia longiores, uniflori, pilis deflexis ornati. *Flores* flavi, sæpius 5–6 poll., interdum usque ad 10 poll., diametro, erecti, iis *Paoniæ* specierum nonnullarum similes, diuturni. *Sepala* ovata, caducissima. *Petala* sæpius 5–10, orbiculari-obovata, plus minusve incurva. *Stamina* innumera. *Capsula* oblonga, 1–1½ poll. longa, 5–8-costata, glabrescens, stigmatibus 5–8 lamelliformibus coronata, valvis totidem brevibus recurvis persistentibus dehiscens. *Semina* oblonga vel subreniformia, circiter lineam longa, testa conspicue reticulata.—*Cathcartia integrifolia*, Maxim. in Mél. Biol. vol. ix. p. 713.

This striking plant was first discovered by the celebrated Russian traveller, Przewalski, in 1872–73, in the extreme north-west of the Province of Kansuh, and he subsequently collected it in several different localities in the same region. Potanin also collected it in Kansuh, in 1885. In 1887 it was collected by Delavay in the Snowy Range of Likiang, Yunnan, at an altitude of 13,000 feet; and in 1890 Mr. A. E. Pratt obtained very fine specimens in the neighbourhood of Tachienlu. Its first appearance in European gardens seems to have been due to the Abbé Farges, who sent seeds to Mr. Maurice L. de Vilmorin in 1895, with whom it flowered in 1897; but it produced no seed, and was consequently lost to cultivation.

In 1903 Messrs. James Veitch & Sons sent Mr. E. H. Wilson on a second journey to China, one of the principal objects being to collect seeds of *Meconopsis integrifolia*. He "found it in millions" in the mountains west of

Tachienlu, at elevations of 11,000 to 15,500 feet; never lower. As might be expected, it is perfectly hardy in the open ground, but, what was less to be expected, it flourishes and flowers freely without any special treatment. Whether it will seed, time will prove. Under the most favourable conditions, in a wild state, Mr. Wilson observed plants about three feet high, bearing as many as eighteen flowers, whilst at its greatest altitudinal limit it is reduced to a rosette of leaves with one flower nestling in the centre.

The plant figured in "Flora and Sylva" differs in having the more open flowers borne singly on stalks arising from the rosettes of leaves, and in the stigmas being borne on an elongated style-column. The specimen collected in the Gooring Valley, at an elevation of about 16,500 feet, by Mr. and Mrs. Littledale, and referred by me (*Journ. Linn. Soc.* vol. xxxv. p. 164) to *M. integrifolia*, certainly does not belong to that species, as it has an elongated style-column.

Descr.—A robust biennial, usually one foot and a half to three feet high, densely clothed with long, silky hairs varying in colour, but usually yellowish brown. *Stem* stout; branches and peduncles in whorls. *Leaves* numerous, mostly linear-lanceolate, six inches to a foot long, shorter on the stem. *Peduncles* longer than the leaves, one-flowered, clothed with reversed hairs. *Flowers* yellow, usually five to six inches in diameter, sometimes as much as ten. *Sepals* ovate, falling at the opening of the flower. *Petals* five to ten, orbicular-obovate, more or less incurved. *Stamens* exceedingly numerous. *Capsule* oblong, one inch to one and a half long, longitudinally five- to eight-ribbed, crowned by the same number of sessile, stigmatic plates, and opening by as many short, recurved, persistent valves. *Seeds* oblong, or nearly reniform, about a line long, with a prominently netted surface.—W. Botting Hemsley.

Fig. 1, a stamen; 2, a pistil:—*both enlarged*; 3, a capsule:—*natural size*; 4, a plant:—***about one-fifth of natural size.***

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Ltd. Imp.

Tab. 8028.

TETRATHECA THYMIFOLIA.

East Australia.

Tremandraceæ.

Tetratheca, *Sm.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 134.

Tetratheca thymifolia, *Sm. Exot. Bot.* vol. i. p. 41, t. 22; *Benth. Fl. Austral.* vol. i. p. 130; ex affinitate *T. ciliata*, a qua sepalis lanceolatis acuminatioribus differt.

Fruticulus erectus, pubescens, ramosissimus, 1–1½ ped. altus, ramis teretibus gracilibus. *Folia* 3–4-natim verticillata, ovato-elliptica vel lanceolata, acuta, marginibus recurva, 4 lin. longa, 1–2 lin. lata. *Pedunculi* quam folia longiores. *Flores* 4-meri. *Sepala* ovato-lanceolata, acuminata, valde pilosa, fere 1½ lin. longa. *Petala* obovata, ante anthesin stamina gemina includentia, 4 lin. longa. *Antheræ* 2-seriatim 4-loculares; tubus brevis. *Stylus* integer, dimidio inferiore pilosus. *Ovarium* pubescens; ovula in quoque loculo 2, superposita.

The *Tremandraceæ*, now for the first time represented in this Magazine, are a purely Australian order.

Tetrathecas are among the oldest of the one-time favourite "New Holland" plants, some of them having been introduced into cultivation a century ago. There are twenty-one species, most of them worth growing. The best known, *T. ericifolia*, *T. hirsuta* and *T. pilosa*, like most of the genus, have drooping flowers, and are none the less beautiful on that account. *T. thymifolia*, even in dull weather, bears its flowers erect with the purple anthers exposed to view.

The order comprises only two other genera, namely, *Platythecа*, which has one representative, the elegant *P. galioides*, and *Tremandra*, a genus of two species.

Descr.—A much-branched, pubescent undershrub, with slender, erect, terete stems, one foot to one and a half high. *Leaves* verticillate in threes or fours, ovate-elliptic or lanceolate, acute, with recurved margins, about four lines long by one to two lines broad. *Pedicels* longer than the leaves. *Flowers* tetramerous. *Sepals* ovate-lanceolate, acuminate, very hairy, nearly one line and a half long. *Petals* obovate, four lines long, each enfolding a pair of anthers when in bud. *Anthers* four-celled, with

two of the cells in front of the two others; anther-tube short. *Style* entire, pilose on the lower half. *Ovary* pubescent, with two superposed ovules in each cell.—L. Farmar.

Fig. 1. a leaf; 2. a flower from which the petals have been removed; 3 and 4, front and back views of stamen; 5. pistil; 6. vertical section of ovary; 7, ovules, with appendage at chalazal end:—*all enlarged*.

M.S. del. J. N. Fitch lith.

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Tab. 8029.

IMPATIENS Holstii.

East Tropical Africa.

Geraniaceæ. Tribe Balsamineæ.

Impatiens, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 277.

Impatiens Holstii, *Engl. et Warb. in Engl. Pflanzenw. Ost-Afr.* C. p. 254; *Bull. Soc. Tosc. Ort.* 1904, p. 339, f. 23; species ex affinitate *I. Sultani* (B. M. t. 6643), a qua foliis latioribus et floribus majoribus vere miniatis differt.

Frutex subcarnosus, 2–3 ped. altus fere undique glaber, ramis rubro-striatis. *Folia* alterna, longe petiolata, ovata vel superiora lanceolata, cum petiolo sæpius 3–4 poll. longa, acuta, crenata, inter crenas unisetosa, utrinque præcipue secus costam venasque parcissime puberula, venis primariis lateralibus utrinque circiter 7 sat conspicuis. *Flores* axillares, solitarii vel pedunculis interdum bifloris, $1\frac{1}{2}$–$1\frac{3}{4}$ poll. diametro, plani; pedunculi quam folia breviores. *Sepala* 3, lateralia lineari-acuta, circiter lineam longa. *Sepalum calcaratum* limbo ovato apiculato, calcare tenui $1\frac{1}{2}$–$1\frac{3}{4}$ poll. longo. *Vexillum* late obcordatum, dorso carinatum. *Petala* lateralia fere bipartita; segmenta oblique obovato-spathulata, rotundata. *Capsula* ignota.

Impatiens Holstii was purchased for Kew in 1894. It is a native of Usambara and Kilimandjaro, growing on the banks of streams in the tropical forest at altitudes of 2,500 to 5,000 feet. Very similar to *I. Sultani*, it bids fair to surpass that species, both in habit and the brilliancy of its flowers, which are produced almost continuously. Several of the African species are very ornamental, and have improved greatly under cultivation. *I. Oliveri* (B. M. t. 7960) is a remarkable instance. Last season it succeeded very well in the open border, attaining considerable dimensions, and as a greenhouse plant it is invaluable, requiring little care. In the spring of the present year there was at Kew a plant, twelve months old from a cutting, four feet high and twelve feet in circumference, bearing about thirty clusters of flowers at one time. The largest flowers were almost three inches in diameter, and both in colour and shape strongly resemble those of *Miltonia vexillaria*.

The purple, oblong, very small, reticulated pollen-grains of *I. Holstii* are very beautiful under a microscope. Their dimensions are about ·0018 × ·0008 of an inch.

August 1st, 1905.

Descr.—A fleshy shrub or herb, almost glabrous in all parts, two to three feet high. *Branches* striped with red. *Leaves* alternate, long-stalked, ovate or the upper ones lanceolate, mostly three to four inches long, acute, crenate, with a solitary bristle between the crenatures, both surfaces, especially on the midrib and primary veins, furnished with a few scurf-like hairs; primary lateral veins about three on each side of the midrib. *Flowers* pure scarlet, axillary, solitary, or rarely two on a common stalk, largest one inch and three quarters across, flat. *Stalks* shorter than the leaves. *Sepals* three; lateral small, scale-like. *Spurred sepal* having an ovate, apiculate limb; spur slender, about an inch and a half long. *Standard* or odd petal broadly obcordate. *Lateral petals* deeply divided into two, nearly equal, obliquely obovate-spathulate, rounded lobes.—W. Botting Hemsley.

Fig. 1, portion of leaf, upper surface; 2, a flower-bud; 3, anthers from a bud; 4, the same from an expanded flower:—*all enlarged.*

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M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Ltd Imp

Tab. 8030.

PLECTRANTHUS crassus.

Nyasaland.

Labiatæ. Tribe Ocimoideæ.

Plectranthus, *L'Hérit.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1175; *Engler & Prantl, Pflanzenfam.* vol. iv. 3 A, p. 352.

Plectranthus crassus, *N. E. Br.* (sp. nov.) *Gard. Chron.* 1904, vol. i. p. 21, sine descriptione apta; ex affinitate *P. alboæruleï*, a qua caule minute velutino foliis basi late cuneatis et spicis multo majoribus differt.

Herba 2½–3-pedalis, radice fibrosa. *Caules* obscure tetragoni, minute velutini, brunnei. *Folii* petiolus ¼-½ poll. longus; lamina 2–3¾ poll. longa, 1¼–2½ poll. lata, ovata, obtuse acuta, basi acute cuneata, supra minutissime appresse pubescentia, subtus reticulato-venosa, minutissime tomentoso-puberula. *Inflorescentia* terminalis, spiciformis, 5–8 poll. longa, simplex vel basi ramosa, verticillis subconfertis sessilibus 8–28-floris. *Pedicelli* 1 lin. longi, puberuli, glandulosi. *Calyx* 1½–2 lin. longus, subæqualiter 5-lobus, antice profunde fissus, pubescens et glandulosus; lobi subulati, acutissimi. *Corolla* cærulea; tubus decurvus, compressus; labium superius in lobos 2 subquadratos divisum, basi lobulis parvis instructum, dorso pubescens; labium inferum 3 lin. longum, cymbiforme, obtusum, pubescens. *Stamina* 2 lin. longa, glabra; filamenta cærulea; antheræ fuscæ. *Discus* albidus, lobo magno antico. *Stylus* staminibus subæquilongus, glaber, cæruleus.

The handsome stove herbaceous plant here figured was discovered in Nyasaland by Mr. John Mahon, who sent it in 1899 to Kew, where it has flowered regularly during the winter months since 1902, forming a useful decorative plant at that season of the year, and may be regarded as a companion plant to *Coleus shirensis* figured in this Magazine (t. 8024). *Plectranthus crassus* requires the same kind of stove treatment.

Descr.—An herbaceous plant, two and a half to three feet high, puberulous and glandular in nearly all parts. *Stem* rather obscurely four-angled, pale brown. *Leaves* spreading; petiole about one-third of an inch long; blade two to four inches long, one to two inches and a half broad, ovate, obtusely acute, cuneate at the base, minutely pubescent on the light green upper surface, veins closely reticulate on the under surface. *Inflorescence* terminal, simple or branched at the base, spike-like, five to eight inches long, about one inch and a half in diameter.

Verticils twelve to twenty, rather crowded, sessile, eight- to twenty-eight-flowered. *Bracts* very deciduous, a quarter to two-thirds of an inch long, a sixth to a third of an inch broad, broadly ovate, acute, mucronate, very concave, ciliate. *Pedicels* about one line long, puberulous and glandular. *Calyx* one and a half to two lines long, pubescent, with spreading hairs intermingled with indigo-coloured glands, lobed nearly to the base in front; dorsal lobe two-thirds of an inch broad, lateral lobes two-fifths of an inch broad at the base, all tapering to a very acute point, dull brownish-purple. *Corolla* light blue, hairy on the back of the upper and lower lips with purple hairs, and with a few white hairs on the underside of the tube, which is one-third of an inch long, bent downwards at its exsertion from the calyx; upper lip a line and a half long, two and a half lines broad, deeply divided into two subquadrate lobes with a small rounded lobule at their base; lower lip three lines long, about a line and a half broad, oblong, obtuse, rather shallowly boat-shaped, about three-quarters of a line deep. *Stamens* two lines long, glabrous; filaments blue; anthers blackish, with yellow pollen. *Style* as long as the stamens, glabrous, blue; stigmas subulate, very acute. *Disk* with a large lobe on the lower side, white.—N. E. Brown.

Figs. 1 and 2, flowers; 3, calyx laid open, exposing ovary; 4, a hair; 5, corolla in section; 6 and 7, anthers; 8, apex of style with stigmas:—*all enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 8031.

ODONTOGLOSSUM RAMULOSUM.

Colombia.

Orchidaceæ.—Tribe Vandeæ.

Odontoglossum, *H. B. et K.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 561; *Pfitzer in Engl. & Prantl, Pflanzenf.* vol. ii. 6, p. 197.

Odontoglossum ramulosum, *Lindl. Fol. Orch. Odont.* p. 13; *Reichb. f. in Bonplandia*, 1855, p. 66; species sectionis *Myanthium*, Lindl., et ex affinitate *O. ixioidis*, a qua paniculis amplioribus, floribus divaricatis, et pedicellis bracteis multo longioribus differt.

Herba epiphytica, rhizomate valido lignoso. *Pseudobulbi* ovoideo-oblongi, subcompressi, circa 3 poll. longi, apice diphylli, basi circa 6-phylli. *Folia* ligulata, subacuta, arcuata, circa 8–12 poll. longa, 9 lin. lata. *Scapus* axillaris, 2½–3 ped. altus, paniculatus, multiflorus. *Bracteæ* ovato-oblongæ, acutæ, concavæ, circa 2 lin. longæ. *Pedicelli* 6–9 lin. longi. *Flores* aurei brunneo-maculati, crista labelli aurantiaca. *Sepala* spathulato-oblonga, subobtusa, 5–6 lin. longa, lateralia paullo recurva. *Petala* late unguiculata, cæteris sepalo postico similia, subconniventia, apice paullo incurva. *Labelli* unguis erectus; limbus reflexus, oblongus, obtusus, brevis; crista 4–6-loba, basi in carinas carnosas 2 ad basin labelli extensa. *Columna* clavata, 2 lin. longa, alis subobsoletis.

The genus *Odontoglossum* contains some of the most popular of cultivated Orchids, though the species are not all equally showy, and some of them are not very highly esteemed in gardens, particularly those belonging to *Myanthium*, which includes the present species. Only two others of this section have appeared in the Botanical Magazine; *O. Edwardi*, Reichb. f. (t. 6771), remarkable for its deep violet-purple flowers, and *O. retusum*, Lindl. (t. 7569), in which the sepals and petals are rich orange-yellow, and the lip deep yellow.

O. ramulosum, Lindl., was originally discovered in the forests of New Grenada by Funck and Schlim, and both living and dried specimens were sent home. It was afterwards found by Purdie on rocks at La Baja, and by Wagener at San Pedro, in Venezuela, at 5,000 feet elevation. It flowered in cultivation as long ago as February, 1849. The plant figured was presented to Kew by Mr. F. W. Moore, A.L.S., Keeper of the Royal Botanic Gardens, Glasnevin, and flowered in February last.

Descr.—An epiphytic herb about a foot to a foot and

a half high apart from the inflorescence; rhizome very stout. *Bulbs* ovoid-oblong, slightly compressed, about three inches long. *Leaves* strap-shaped, subacute, somewhat curved, about eight to twelve inches long by three-quarters to an inch broad, bright green. *Scape* from the base of the bulb, about two and a half to three feet high, panicled above with about six or eight side branches and numerous flowers. *Bracts* ovate-oblong, acute, concave, about two lines long. *Pedicels* about six to nine lines long. *Flowers* bright yellow, with a large brown blotch at the base of the petals and dorsal sepal, a few spots on the lateral sepals, and a brown band on the lip in front of the orange crest. *Sepals* spathulate-oblong, subobtuse, five to six lines long, the lateral pair somewhat recurved. *Petals* with short broad claws, otherwise much like the dorsal sepal in shape, and somewhat connivent, slightly incurved at the apex. *Lip* with erect claw and oblong, obtuse, reflexed limb, rather shorter than the other segments; crest with four or six fleshy lobes, and a pair of very stout parallel keels extending to the base of the lip. *Column* clavate, about two lines long, without wings.—R. A. Rolfe.

Figs. 1 and 2, column and lip; 3, anther-case; 4 and 5, pollinarium, seen from front and back:—*all much enlarged*.

Note to Tab. 8019.

Fieldia was introduced in 1826, though not figured in the Botanical Magazine till 1858. Sir Joseph Hooker writes that he certainly had *Rhabdothamnus Solandri* in view in 1854 as then in cultivation, and not *Fieldia*, with which, botanically, it could not be confused.

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M. S. del. J. N. Fitch lith.

Vincent, Brooks Day & Son Ltd. Imp

L Reeve & C° London

Tab. 8032.

PETASITES japonicus.

Eastern Asia.

Compositæ. Tribe Senecionideæ.

Petasites, *Gærtn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 438.

Petasites japonicus, *Maxim. in "The Award of the thirty-fourth Demidovian Prize"* (Russian), 1866, p. 212; separate edition, p. 17; *Miq. Prol. Fl. Jap.* (1865–67) p. 380; *Fr. Schmidt, Reisen in Amurlande,* 1868, p. 145; *Franch. et Savat. Enum. Pl. Jap.* vol. i. (1875) p. 220; species foliorum **radicalium magnitudine insignis.**

Herba perennis, robusta, dioica vel subdioica, præter inflorescentiam acaulis. *Folia* radicalia subcarnosa, orbicularia, basi reniformi-cordata, 2–3 ped. diametro, pedatinervia, sinuato-dentata, dentibus acutis, subtus albo-tomentosa, supra cano-floccosa, cito glabrescentia; petioli in plantis agrestibus interdum ultra 6 ped. alti et 2 poll. diametro. *Inflorescentia* subdioica, 6–12 poll. alta, ante folia evoluta; scapus crassus, bracteis oblongis costatis vestitus. *Capitula* discoidea, numerosissima, dense corymbosa. *Flores* albi.—*Petasitis vulgaris,* Kæmpf., Amœn. Exot. 1712, p. 831. *Tussilago Petasites,* Thunb. Fl. Jap. 1784, p. 314, non Linn. *Nardosmia japonica,* Sieb. et Zucc. in Abhandl. Akad. Muench. vol. iv. 3 (1846), p. 181, reprint, p. 57. *Petasites albus,* A. Gr. in Perry's Exped. to China & Japan, vol. ii. (1857), p. 314, non Gærtn. *Petasites spurius,* Miq. in Ann. Mus. Bot. Lugd. Bat. vol. ii. (1865–66), p. 168, non Reichb. f. *Petasites giganteus,* Fr. Schmidt, ex Trautv. in Acta Horti Petrop. vol. viii. (1883), p. 433. *Petasites japonicus,* var. *giganteus,* Gard. Chron. 1897, vol. ii. p. 311; Nichols. Dict. Gard. Cent. Suppl. vol. ii. (1901), p. 591. *Iama bouki,* &c. Honzo Zufu, vol. xviii. tt. 4, 5, 6, et 7. *Fouki,* Somoku Zusetzu, vol. xvii. tt. 25 et 26.

The synonymy of this plant is very much involved, through errors of transcription, and we are greatly indebted to Mr. Boris Fedschenko, the Chief Botanist of the Imperial Botanic Garden, St. Petersburg, for assistance in unravelling it.

The name *Petasites* signifies parasol, and was given in allusion to the large radical leaves of the species on which the genus was founded. All, or most of the species have this character in common, the leaves attaining their full development long after the flowering-period; and the leaves of *P. japonicus* exceed those of all others in their dimensions. Schmidt seems to have been the first to describe the fully formed leaves, and he states that in the Island of Saghalien the leaf-stalk is taller than a man, whilst the blade reaches a diameter of three feet. In the Kew Herbarium there is a nature-print of a leaf presented

by Dr. Tokutaro Ito some years ago, nearly equalling the dimensions named.

The vegetation of the Island of Saghalien and Kamtchatka is characterized in places by the extraordinary size of a number of herbaceous plants, which rise to a height of ten to fifteen feet. Prominent among them are species of *Spiræa*, *Sanguisorba*, *Heracleum*, *Angelica*, *Urtica*, and *Festuca*.

Petasites japonicus has long been a cultivated plant in Japan, and the figures in the "Honzo Zufu" cited above include varieties having leaves and bracts variously striped with white and red, and one in which the bracts of the inflorescence and young leaves are deep red, edged with white, and striped with green.

Kew first obtained this plant, in 1899, from the Yokohama Nursery Company, in whose Catalogue for 1898 there is a humorous pictorial representation of the use of the leaves as umbrellas, and it was there probably that it first received the varietal name of *giganteus*. This was superfluous, because Schmidt gives equally large dimensions for the wild plant in Saghalien. On the authority of this Catalogue "the big petioles are eaten as a vegetable, either boiled or preserved in salt or sugar, and its flower-buds are used fresh as a condiment and spice, owing to their agreeable flavour and slightly bitter taste." For a further stock Kew is indebted to B. E. C. Chambers, Esq., of Grayswood Hill, Haslemere, who presented it in 1903. It is now flourishing in the Temperate House, and on the bank of the pond in the front of the Museum; but it does not at present attain the gigantic dimensions it does in its home in Eastern Asia.

Descr.—A perennial herb varying greatly in dimensions, but attaining a very large size under cultivation. *Stemless* except the inflorescences, which are functionally unisexual. *Leaves* appearing later than the flowers orbicular, reniform-cordate at the base, coarsely toothed and veined, at first clothed with a felt-like, white indumentum, but soon becoming glabrous. *Flower-stems* appearing before the leaves, stout, clothed with oblong, ribbed bracts. *Flowers* white, densely corymbose.—W. Botting Hemsley.

Figs. 1 and 2, flowers (female) from the circumference of the head; 3, flower (hermaphrodite) from the centre of the head; 4, a pappus-bristle; 5, anthers; 6, upper part of style and stigma:—*all enlarged.*

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Tab. 8033.

CIRRHOPETALUM BREVISCAPUM.

Malaya.

Orchidaceæ. Tribe Epidendreæ.

Cirrhopetalum, *Linn.*: *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 504; *Pfitzer in Engl. & Prantl, Pflanzenf.* vol. ii. 6, p. 178.

Cirrhopetalum breviscapum, *Rolfe* (*sp. nov.*); aff. *C. lasiochilo*, Hook. f., foliis latioribus, sepalis lateralibus longioribus flavis brunneo-maculatis et labelli pilis tenuioribus distincta.

Herba epiphytica, rhizomate repente vaginis imbricatis tecto. *Pseudobulbi* oblongi, tetragoni, 8–10 lin. longi, monophylli, vaginis 2 ovatis dimidio brevioribus tecti. *Folia* subsessilia, elliptico-oblonga, obtusa vel obscure bidentata, coriacea, pallide viridia, 1¼–2 poll. longa. *Scapi* ad pseudobulborum basin solitarii, erecti, 1½ poll. longi, pallide virides, brunneo-maculati, uniflori. *Bracteæ* ovato-lanceolatæ, acutæ, 2 lin. longæ. *Flores* speciosi; sepalum posticum, petala et labellum purpureum; sepala lateralia flava, brunneo-maculata. *Sepalum posticum* lanceolato-oblongum, acutum, incurvum, concavum, eciliatum, 8–9 lin. longum. *Sepala lateralia* basi connata, dein libera, oblonga, subobtusa, recurva, subtorta, 1 poll. longa. *Petala* lanceolata, acuta, patentia, 8–9 lin. longa. *Labellum* carnosum, 5 lin. longum, basi late cordatum, dein subito constrictum, apice oblongum, obtusum, apice excepto pilis longis vestitum. *Columna* basi lata, apice angusta, 3 lin. longa; dentes graciles, acutæ, incurvæ; anthera puberula.

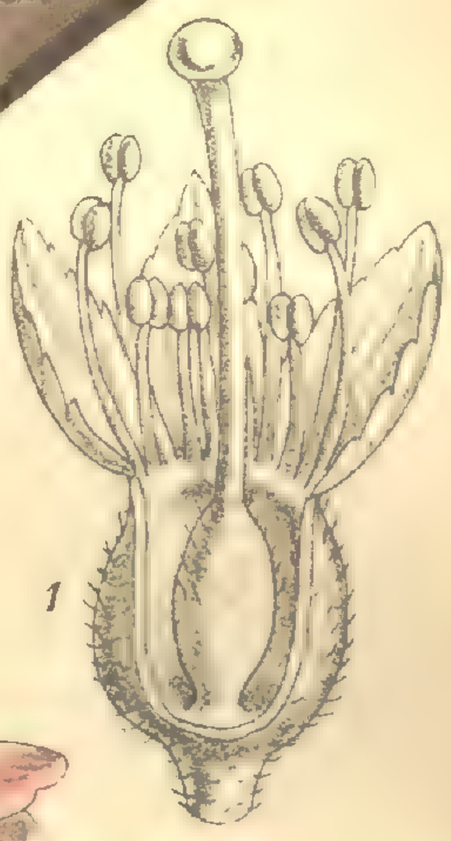
Cirrhopetalum is rather a large and polymorphic genus closely allied to *Bulbophyllum*, and not always clearly separable from it. Upwards of forty Indian species have been described, and the Malayan representatives must be almost equally numerous, though several of them are very imperfectly known. Besides these there are a few representatives in South China, and a single outlier in the Mascarene and Polynesian islands, *C. Thouarsii*, Lindl., on which the genus was originally founded. They are remarkable for the elongation of the lateral sepals, and for having the flowers usually borne in an umbel. In *C. refractum*, Zoll., and one or two allies, however, the flowers are racemose, while in the one now figured and a few others they are solitary. Upwards of a dozen species have already been figured in this Magazine, among the more distinct and remarkable being *C. fimbriatum*, Lindl. (t. 4391), *C. Cumingii*, Lindl. (t. 4996), *C. Thouarsii*, Lindl. (t. 7214), *C. ornatissimum*, Reichb. f.

(t. 7229), *C. Collettii*, Hemsl. (t. 7198), *C. Hookeri*, Duthie (t. 7869), *C. Curtisii*, Hook. f. (t. 7554), and *C. robustum*, Rolfe (t. 7557).

C. breviscapum is a native of Perak, and a plant of it, presented to Kew, in 1903, by Mr. F. W. Moore, A.L.S., Keeper of the Royal Botanic Gardens, Glasnevin, flowered in a tropical house in March last. The three other Indian species having one-flowered scapes are *C. merguense*, Hook. f., *C. lasiochilum*, Hook. f., and *C. appendiculatum*, Rolfe.

Descr.—An epiphytic herb with creeping rhizomes covered with imbricating sheaths. *Bulbs* oblong, tetragonal, eight to ten lines long, one-leaved, with a pair of loose ovate sheaths at the base about half as long as the bulb. *Leaves* subsessile, elliptic-oblong, obtuse or obscurely bidentate, coriaceous, light green, one to two inches long. *Scapes* erect, about one inch and a half high, light green marked with red-brown, one-flowered. *Bract* ovate-lanceolate, acute, about two lines long. *Flowers* rather large, the dorsal sepal and petals dull purple, the lateral sepals yellow spotted with red-brown, and the lip rose-purple. *Dorsal* sepal lanceolate-oblong, acute, incurved, concave, not fringed, about eight or nine lines long; lateral sepals free, except at the base, oblong, subobtuse, recurved, somewhat twisted, about an inch long. *Petals* lanceolate, acute, spreading, about as long as the dorsal sepal. *Lip* fleshy, about four lines long, broadly cordate at the base, rapidly narrowing to the middle, and prolonged in front into an oblong, obtuse lobe, all but the front lobe covered with long spreading purple hairs. *Column* very broad at the base, narrowing upwards, about three lines long, with a pair of slender curved teeth at the apex, prolonged into a narrow incurved foot at the base; anther-case puberulous.—R. A. Rolfe.

Fig. 1, flower with sepals and petals removed; 2, lip; 3, anther-case, seen from the side; 4, pollinia:—*all much enlarged.*



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Tab. 8034.

PRUNUS pendula.

Japan.

Rosaceæ. Tribe Pruneæ.

Prunus, *L.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 609.

Prunus pendula, *Maxim. in Bull. Acad. Imp. Sc. St. Petersbourg,* vol. xxix. (1884), p. 98; *Mél. Biol.* vol. xi. p. 690; *Sargent in Garden & Forest,* vol. i. (1888) p. 196, fig. 36, vol. ii. p. 487 (figure of an old tree). *Kœhne, Deutsch. Dendrol.* p. 307; *Dippel, Laubholzk.* vol. iii. p. 618; *Cyclop. Am. Hort.* p. 1452, fig. 1996; affinis *P. inciso,* Thunb., sed innovationibus pilosis, foliis infra tantum in nervis pilosis, floribus numerosioribus, **sepalis denticulatis et stylo piloso differt.**

Arbuscula vel arbor media, ramis flexuosis magis minusve pendulis cortice fusco vel fusco-nigricante tectis, ramulis juventute pilosis gracilibus. *Folia* post flores evoluta, anguste elliptica vel elliptico-lanceolata, apice basique acuta, 1½–2 poll. longa, 10–12 lin. lata, inæqualiter argute serrata, serraturis apice glanduloso-incrassatis, supra jam in gemma præter costam parce pilosam glabra, subtus in costa nervisque adpresse pilosa tandem glabrata; nervi secundarii subrecti, obliqui, utrinque circiter 10-12; petiolus gracilis, molliter pilosus, 3–6 lin. longus; stipulæ subulatæ, breviter glanduloso-fimbriatæ, ad 5 lin. longæ, deciduæ. *Flores* in racemos abbreviatos 5–2-floros brevissime pedunculatos vel sessile bracteatos dispositi; pedunculi vel racemi basi perulis rotundatis vel late ovatis subcoriaceis nigro-fuscis pilosulis demum deciduis cincti; bracteæ lanceolatæ vel subulatæ, pilosæ, longitudine valde variæ, caducæ; pedicelli ¼–½ poll. longi, patule pilosi. *Receptaculum* campanulatum, 1½–2 lin. longum, pilosulum. *Sepala* ovata vel ovato-lanceolata, acuta, minute denticulata, 1–1½ lin. longa, pilosula. *Petala* rosea, rotundato-obovata vel obovata, apice leviter emarginata. *Stamina* inæquilonga, quam petala multo breviora. *Ovarium* glabrum; stylus stamina paulo superans, basi densiuscule patule pilosus. *Drupa* pisiformis, nigra.—*P. itosakura,* Sieb. Syn. Pl. Oecon. in Verhandl. Batav. Genootsch. vol. xii. (1830), p. 68, no. 360 (nomen). *P. subhirtella,* Miq. Prolus. Fl. Jap. in Ann. Mus. Bot. Lugd. Bat. vol. ii. p. 91 (excl. var.). *P. subhirtella* var. *pendula,* Usef. Pl. Japan, p. 153, fig. 620. *P.* sp. Savatier, Livres Kwa-wi, p. 72 (Kwa-wi, ed. 1759, vol. i. t. 3). *Cerasus pendula rosea,* Flor. Mag. vol. x. t. 536. *C. herincquiana,* Lav. in Arb. Segrez. p. 117, t. xxxv.

Prunus pendula, according to Maximowicz, has been found in the wild state in the mountain forests of Central Nipon; but of this no specimens are at Kew. It is not uncommonly cultivated in gardens and near temples in Japan, and a good figure of it was published in the Kwa-wi as early as 1759. It is called there Ito sakura, evidently in allusion to the long, slender branches, ito meaning thread, whilst sakura is the name of the cherry tree. Siebold, therefore, took it

up as *P. itosakura*, but as he gave no proper description, this name is generally disregarded. It was subsequently described as *P. subhirtella*, Miq. Siebold introduced it into Europe about 1863, under the name of *Cerasus pendula rosea*. When Maximowicz revised the Chinese and Japanese species of the genus *Prunus*, he adopted the name *P. pendula* for our plant in preference to Miquel's name *P. subhirtella*, as he thought that Miquel had confused several distinct species under his *P. subhirtella*. How far Maximowicz was justified in his assumption cannot be established without the examination of Miquel's specimens; in any case Maximowicz's name has so generally been accepted ever since that it would be inconvenient to give it up without the most urgent reasons.

There are several varieties of *P. pendula* with flowers ranging from the palest pink to saturated rose colour, and it is very probable that the plant described and figured here is merely a state, with pendulous branches, of a species with normally erect branches, analogous habit variations occurring in several species of *Prunus*. The specimen from which the plate was drawn was raised at Kew from seeds received from Professor Sargent, Arnold Arboretum, in 1890. The little tree is now about nine feet high, and flowers profusely in March.

Descr.—A small or middle-sized tree. *Branches* spreading, flexuous, pendulous, hairy when young; bark becoming smooth, light or dark brown to almost black. *Leaves* unfolding after the flowers, narrowly elliptic or elliptic-lanceolate, acute at both ends, sharply and unequally serrate, serratures thickened at the tips, with or without one or two glands near the base, glabrous above except midrib, adpressedly hairy below, particularly on the nerves, more or less glabrescent, lateral nerves ten to twelve on each side, rather oblique, straight and parallel; petiole slender, three to six lines long, softly hairy; stipules subulate, glandular-fimbriate, deciduous, about as long as the petioles. *Flowers* five to two in very short, shortly peduncled or sessile racemes, springing from buds with dark, puberulous, rounded scales; peduncle, where developed, pedicels and the receptacle softly hairy; pedicels three to six lines long; bracts caducous, lan-

ceolate or subulate. *Receptacle* campanulate, about two lines long. *Sepals* ovate to ovate-lanceolate, acute, minutely toothed, about one line and a half long. *Petals* rose-colour, rotundate-obovate or obovate, slightly emarginate, three to five lines long. *Stamens* unequal, the longest considerably shorter than the petals. *Ovary* glabrous; style hairy, particularly near the subpersistent base. *Drupe* black, of the size and shape of a pea.—Otto Stapf.

Fig. 1, flower with the petals removed, cut open; 2 and 3, stamens:—*all enlarged.*

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Tab. 8035.

SCILLA messeniaca.

Greece.

Liliaceæ. Tribe Scilleæ.

Scilla, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 814.

Scilla messeniaca, *Boiss. Diagn., ser.* 1, 7 (1846), p. 110, et in *Fl. Orient.* vol. v. (1881), p. 226; ex affinitate *S. pratensis*, W. K., a qua foliis multo latioribus differt.

Bulbus ovoideus, tunicis pallidis vestitus, 1 poll. diametro. *Folia* 5–7, synanthia, late linearia, basi attenuata, apice abrupte acuminata, 6–9 lin. lata, 6–9 poll. longa. *Scapus* angulatus, foliis paullo brevior. *Racemus* ovato-oblongus, 10–20-florus. *Pedicelli* erecto-patuli, perianthium æquantes vel paullo longiores. *Bracteæ* solitariæ, minutissimæ, truncatæ vel interdum profunde bifidæ. *Perianthium* pallide azureum, 3 lin. longum; segmenta linearia, obtusa, erecto-patula. *Staminum* filamenta azurea, quam perianthium paullo breviora; antheræ violaceæ. *Stylus* ovario paullo longior. *Ovula* in loculis geminata. *Capsula* globosa, obtuse trigona, 3 lin. longa.—*S. amœna*, Bory et Chaub. Fl. Pelop. p. 15 non L.

The genus *Scilla* contains over a hundred described species, native of Europe, Asia, and Africa, chiefly extra-tropical South Africa; and one is a native of Chili and another of Peru. The section *Euscilla*, to which the present one belongs, is characterized by the perianth-segments spreading from the base.

S. messeniaca bears a resemblance as regards the raceme to *S. pratensis*, which comes into flower two months later. The leaves, however, are totally different from those of that species.

Although described some sixty years ago, this *Scilla* does not appear to have been introduced into gardens until recently. Its habitat is confined to the Morea. There is in the Kew Herbarium only one specimen, which is from the valley of the Nedon, at Kalamata in Messenia, at an elevation of 500 to 1,000 feet. It is also recorded from the neighbouring provinces of Arcadia and Laconia, where it flourishes in the grassy, stony, lower regions.

Bulbs were purchased from Mr. Max Leichtlin in 1897. They now form a large clump in the herbaceous ground at Kew, and flower freely in March.

Among the species of *Scilla* most useful for the garden already represented in this Magazine are:—*S. amœna*

(t. 341), *S. bifolia* (t. 746), *S. hispanica* (t. 128), *S. hyacinthoides* (t. 1140), and *S. sibirica* (t. 2408).

Descr.—*Bulb* ovoid, one inch in diameter; outer scales pale. *Leaves* five to seven, flat, broadly linear, attenuate at the base, with apex abruptly acuminate, one half to three-quarters of an inch broad, six to nine inches long. *Scape* angular, slightly shorter than the leaves. *Raceme* ovate-oblong, ten- to twenty-flowered. *Pedicels* ascending or somewhat spreading, equal to the perianth or slightly longer. *Bracts* solitary, very minute, truncate, or sometimes deeply bifid. *Perianth* pale blue, three lines long, with somewhat spreading, linear, obtuse segments. *Filaments* blue, slightly shorter than the perianth. *Anthers* violet. *Style* slightly longer than the ovary. *Ovules* two in each cell. *Capsule* globose, obtusely three-angled, three lines long.—L. Farmar.

Figs. 1 and 2, anthers; 3, pistil:—*all enlarged.*

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Tab. 8036.

COTYLEDON insignis.

Nyasaland.

Crassulaceæ.

Cotyledon, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 659; *Engl. & Prantl, Pflanzenf.* vol. iii. 2 A, p. 32.

Cotyledon insignis, *N.E. Br.* (*sp. nov.*); inter species floribus majoribus, foliis oppositis et cymis axillaribus distinctissima.

Planta succulenta, 2 ped. alta, omnino glabra, floribus exceptis ex toto viridis. *Folia* opposita, breviter petiolata, recurva, 3–5 poll. longa, 1–2 poll. lata, oblonga vel oblanceolato-oblonga, obtusa, basi angustata, integra vel obscure dentata. *Cymæ* axillares et terminales, pedunculatæ, 1–3-floræ. *Bracteæ* ½–1 poll. longæ, ¼–½ poll. latæ, lanceolatæ vel oblongo-lanceolatæ, acutæ. *Pedicelli* 6–9 lin. longi. *Calyx* 4–5 lin. longus, 4-lobus; lobi erecti, 3–4 lin. longi, lanceolati, acuti. *Corollæ* tubus circiter 1½ poll. longus, leviter curvatus, rubescens; lobi recurvi, 7–8 lin. longi, circiter ¼ poll. lati, lanceolati, acuti, luteo-virentes, rubescentes, dorso rubri. *Stamina* exserta; antheræ oblongæ, rubescentes. *Glandulæ* hypogynæ 3 lin. longæ, elongato-ovatæ, apice bifidæ. *Carpella* 4; styli filiformes, exserti.

This fine *Cotyledon* is one of the most distinct in the genus, differing in habit from all other known species. Its flowers have some resemblance to those of *C. curviflora*, Sims (B. M. t. 2044), but in all other respects it is entirely different. It was discovered on one of the mountains of Nyasaland, British Central Africa, at an altitude of 7000 feet, by Mr. John Mahon, who sent seeds of it to Kew in 1898, where it first flowered in February of this year. It requires cool stove treatment, similar to that given to the various species of *Kalanchoe*.

Descr.—A succulent plant about two feet high, glabrous on all parts. *Stems* or branches erect, about half an inch thick, light green, not glaucous. *Leaves* opposite, much recurved, three to five inches long, one to two inches broad, one to one line and a half thick, oblong or oblanceolate-oblong, obtuse, cuneately narrowed into a short petiole at the base, entire or obscurely dentate, flat, with the midrib faintly channelled above, slightly prominent beneath, green, somewhat shining, not glaucous. *Cymes* from the axils of the upper leaves and terminal, pedunculate, one- to three-flowered. *Peduncles* two to ten lines long. *Bracts* half to one inch long, ¼–½ inch

broad, leaf-like, lanceolate, or oblong-lanceolate, acute. *Pedicels* two-thirds to three-quarters of an inch long, green. *Calyx* four to five lines long, deeply four-lobed, glabrous, green, shining, lobes 3–4 lines long, erect, lanceolate, acute, convex on the back. *Corolla-tube* about one inch and a half long, $\frac{1}{4}$ inch in diameter, obscurely four-angled, slightly curved upwards, light reddish; limb slightly oblique, four-lobed; lobes seven to eight lines long, about $\frac{1}{4}$ inch broad, lanceolate acute, much recurved, light red on the back, and more or less suffused with light red on a yellowish-green ground on the inner face. *Stamens* eight, much exserted; filaments faintly tinted with red, adnate to the corolla, in two sets of four, for one half and three-quarters of its length respectively, four of them dilated, and forming broad lanceolate plaits at the base of the corolla-tube; anthers oblong, reddish. *Hypogynous glands* $\frac{1}{4}$ inch long, elongate-ovate, narrowed above, bifid at the apex, light green with yellowish tips. *Carpels* four; ovary half an inch long, green, tapering into filiform exserted styles, a little more than an inch long, yellowish-green; stigmas simple.—N. E. Brown.

Fig. 1, anther; 2, hypogynous glands and pistil; 3, the same larger without the styles:—*all enlarged.*

M.S. del, J.N. Pitch lith

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Tab. 8037.

BRACHYGLOTTIS REPANDA.

New Zealand.

Compositæ. Tribe Senecionideæ.

Brachyglottis, *Forst.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 444.

Brachyglottis repanda, *Forst. Char. Gen.* (1776), p. 92, t. 46; *Hook. f. Handb. N. Zeal. Fl.* p. 163; *Kirk, Students' Flora of N. Z.* p. 336; *Gard. Chron.* 1895, vol. i. p. 736, f. 110; species a *B. Rangiora,* Buch., foliis minoribus non lucidis et involucri bracteis albis nitidis differt.

Frutex vel arbor parva, 8–20 ped. alta. *Rami* albo-tomentosi, molles. *Folia* alterna, longe petiolata, papyracea, absque petiolo sæpius 4–8 poll. longa et 2–5 lata, nunc minora nunc majora, ovato-oblonga, basi cordata vel rotundata, vel superiora minora cuneata, angulato-paucilobulata, supra atroviridia, subtus albo-tomentosa; petioli 1–3 poll. longi. *Capitula* numerosissima, 2–3 lin. diametro, in paniculas amplas terminales pyramidales folia excedentia disposita, sessilia, ramulis tomentosis. *Involucri* bracteæ 6–8, uniseriatæ, oblongæ, scariosæ. *Flores* 8–12, vix 2 lin. longi, exteriores feminei, corolla alba ligulata; interiores hermaphroditi, corolla tubulosa lobis recurvis. *Antheræ* luteæ. *Achænia* minuta, papillis hyalinis conspersa. *Pappi* setæ copiosæ, uniseriatæ, albæ.—*Cineraria repanda,* Forst. Prodr. Fl. Ins. Austral. (1786), p. 56; *Senecio Forsteri,* Hook. f. Fl. N. Zel. i. p. 148, non Philippi, nec Schlecht.

Kirk retains Buchanan's *B. Rangiora,* probably because the natives distinguish two species; but he observes that it is not satisfactory as a species, and we have failed to sort the dried specimens into two. Kirk adds that it is much handsomer than *B. repanda,* the *pukapuka* or *wharangi-tawhito* of the Maoris; the leaves more glossy and larger, sometimes as much as twelve inches by fifteen without the petiole. Perhaps the plant figured is the *Rangiora* of the Maoris, though that is described as having purple involucres. At all events it produces leaves under cultivation equally as large as indicated for *B. Rangiora* by Kirk. *B. repanda,* as we shall continue to call it, was introduced, or perhaps re-introduced, about a dozen years ago, and succeeds well out of doors in the West of England and in Ireland, especially near the sea; and it is a very striking object. Earl Annesley ("Beautiful and Rare Trees and Plants," t. 29) shows the habit in a specimen growing in the open air in his grounds at Castlewellan. It flowers freely in the Scilly Islands, and

as a comparatively small plant in pots at Kew, but a specimen eight feet high in one of the beds in the Temperate House has hitherto, we believe, not flowered. A specimen in the Kew Herbarium received from Mr. F. W. Burbidge in 1895 has an inflorescence a foot long and a foot wide at the base. It flowered under glass in the Trinity College Botanic Garden.

It appears that the colonists sometimes call this the paper-tree, but this name is evidently not in general use, for we have not met with it in print. It is pencilled in a Kew copy of Hooker's "Handbook." Nevertheless it is an appropriate name, as the leaves may be used for writing on; a fact discovered long ago. Accompanying a specimen in the Kew Herbarium, collected by R. Cunningham, in 1834, is the following note:—"During the time I was occupying the tented field at Wangaroa, Sadler and I used to correspond through the medium of *pukapukas*. The back of the leaf, even in the recent state, takes the ink capitally." We have not tried fresh leaves, but it is quite true for dried ones.

Buchanan states (*Trans. N. Z. Inst.* vol. xiv. p. 357) that both species are poisonous to horses, which should be taken into account by intending planters.

Descr.—A shrub or small tree eight to twenty feet high. *Branches* clothed with a short, white indumentum. *Leaves* alternate, long-stalked, without the stalk usually four to eight inches long, sometimes larger, sometimes smaller, ovate-oblong, cordate or rounded at the base, uppermost cuneate, few-lobed, lobes short, obtuse, dark green above, white beneath; stalks one to three inches long. *Flower-heads* very numerous, two to three lines in diameter, sessile, arranged in large terminal, pyramidal panicles, longer than the leaves; branches white. *Bracts* of the involucre six to eight, uniseriate, oblong, scarious. *Flowers* eight to twelve in a head, scarcely two lines long. *Corolla* white, lobes recurved. *Anthers* yellow. *Achenes* very small, papillose. *Pappus* white, silky.—W. Botting Hemsley.

Fig. 1, a flower-head; 2, a ray-flower; 3, a disk-flower; 4. anthers; 5. upper part of style and stigmas:—*all enlarged.*

M.S. del. J.N. Pitchlith.

Vincent Brooks, Day & Son Lith. Imp.

L. Reeve & Cº London

Tab. 8038.

SKIMMIA japonica.

Japan.

Rutaceæ.—Tribe Toddalieæ.

Skimmia, *Thunb.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 302; *Engl. in Engl. & Prantl, Pflanzenf.* vol. iii. 4, p. 181.

Skimmia japonica, *Thunb. Fl. Jap.* p. 62; *Kæmpfer, Ic. Sel. Plant.* t. 5; *Sieb. et Zucc. Fl. Jap.* vol. i. p. 127, t. 68; *M. T. M. in Gard. Chron.* 1889, vol. i. p. 520, ff. 89 et 90; *Honzo Zufu,* vol. xxiv. f. 5, *non Lindl. et Paxt. Fl. Gard.* ii. p. 56, f. 163, *nec Hook. Bot. Mag.* t. 4719; species japonica foliis pallide viridibus floribus polygamis drupis globosis vel depresso-globosis coccineo-rubris.

Frutex sempervirens, dumosus, nanus, omnibus partibus aromaticus, inflorescentia minute puberula excepta, glaberrimus. *Folia* alterna, sæpe pseudo-verticillata, breviter petiolata, coriacea, nitida, pallide viridia, obovato-oblonga, oblonga vel lanceolata, 2–5- (sæpe 3–4-) poll. longa, ½–1¾ poll. lata, acuta, acuminata vel obtusa, basi attenuata, integerrima, pellucide glanduloso-punctata; petioli crassi, sæpissime rubescentes. *Flores* polygami, suaveolentes, parvi, in paniculas thyrsoideas terminales 2–3-poll. longas dispositi; pedicelli crassi, breves, bracteolis parvis oppositis instructi. *Calyx* breviter 4–5-lobatus. *Petala* 4–5, oblonga, alba, circiter 2 lin. longa et 1¼ lin. lata. *Stamina* 4–5, petalis æquilonga. *Ovarium* globosum, plerumque 4-loculare loculis 1-ovulatis; rudimentum in floribus masculinis depresso-globosum, calyce multo brevius. *Stylus* simplex, crassus, brevis, stigmate incrassato 3- vel 4-lobato. *Drupa* globosa vel depresso-globosa vel obsolete 3–4-sulcata, interdum apice concava, circiter 4 lin. diam., coccineo-rubra, 2–4-pyrena. *Pyrenæ* subtrigonæ, dorso convexæ, 2¼–2½ lin. longæ.—*S. oblata,* T. Moore in Gard. Chron. 1864, p. 962; *S. fragrans,* Carrière in Rev. Hort. 1869, p. 258; 1880, p. 56, f. 11. *S. fragrantissima,* Hort. ex T. Moore in Proc. Linn. Soc. 1866–67, p. 7.

The *Skimmia* here figured is a very familiar inhabitant of our gardens. As long ago as 1838 it had a place in the living collections at Kew, though its introduction into general cultivation did not follow till the early sixties, when Standish, of Bagshot, received it from Robert Fortune, who obtained it during his visit to Japan in 1860–61. Thomas Moore, in 1864, gave it the name of *S. oblata.*

Fortune had in 1849 sent home a *Skimmia* from China, which Lindley at first thought to be *S. Laureola.* Afterwards it was generally accepted as the true *S. japonica,* and under that name was figured and described in this Magazine in 1853 (t. 4719). Fortune's Chinese plant is

now known as *S. Fortunei*, Masters. Dr. Masters, in his interesting account of the genus, published in the *Gardener's Chronicle*, in 1889, calls attention to the darker green leaves of *S. Fortunei*, its invariably hermaphrodite flowers, and obovate, dull crimson fruits.

Numerous Skimmias have originated in gardens, and have received distinguishing names. The history of the more important is given in Dr. Masters' paper.

All the Kew plants of *S. japonica*, so far as examined, are dicœcious, and the flowers tetramerous. Precocious germination of the seeds, not infrequent in *Rutaceæ*, and already recorded in *Skimmia* itself, was observed in the case of one fruit still attached to the plant. In this the large green embryo was bursting through the epicarp.

It may be mentioned that Dr. Engler limits *Skimmia* to only one species, uniting therefore with the species here figured not only *S. Fortunei*, but also the less hardy *S. Laureola*, which, in gardens at least, from its different behaviour under cultivation, and its less agreeable odour, long ago noted by Lindley, is held to be quite distinct.

Descr.—An evergreen, bushy, dwarf, aromatic shrub, quite glabrous, except the minutely puberulous inflorescence. *Leaves* alternate, often nearly verticillate, shortly petiolate, coriaceous, shining, pale green, obovate-oblong to lanceolate, two to five (often three to four) inches long, half to one and three-quarters of an inch broad, acute, acuminate or obtuse, attenuated at the base, quite entire, studded with transparent glands; petioles thick. *Flowers* fragrant, small, in terminal thyrsoid panicles two to three inches long; pedicels thick, short; bracteoles small, opposite. *Calyx* shortly four- or five-lobed. *Petals* four or five, oblong, white, about two lines long, and one line and a quarter broad. *Stamens* four or five, as long as the petals. *Ovary* globose, usually four-celled; cells one-ovuled. *Drupe* globose or depressed-globose, about four lines in diameter, bright red.—S. A. Skan.

Figs. 1 and 2, male inflorescence and flower; 3 and 4, female inflorescence and flower; 5, fruiting branch:—1, 3, and 5, *natural size*; 2 and 4, *enlarged*.

M.S. del. J.N. Fitch lith.

Vincent Brooks Day & Son Lt.d Imp

Tab. 8039.

FORSYTHIA europæa.

Albania.

Oleaceæ.—Tribe Syringeæ.

Forsythia, *Vahl*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 675.

Forsythia europæa, *Degen et Baldacci in Œsterreich. Bot. Zeit.* 1897, p. 406; *Mitteil. der Deutschen Dendrol. Gesellsch.* 1903, p. 113; *Gard. Chron.* 1904, vol. ii. p. 123, f. 50; ab *F. viridissima* foliis crassioribus ovatis infra medium latioribus et floribus suberectis differt.

Frutex erectus, paucipedalis, dense ramosus, cortice brunneo sæpius crebre lenticellato verrucoso. *Folia* opposita vel interdum quaterna, petiolata, demum subcoriacea, cito glabrescentia, alia innovationum superiora ovata vel ovato-lanceolata, obtusa 2–2½ poll. longa, integra, vel rarius plus minusve argute serrata, alia inferiora oblonga, deorsum gradatim minora. *Flores* ante folia evoluta, e gemma 1–3-ni, flavi, circiter 1½ poll. diametro; pedunculi floribus breviores, perulati, perulis imbricatis ovato-oblongis persistentibus. *Calycis lobi* ovati, circiter 2 lin. longi, apiculati, ciliolati. *Corollæ lobi* lineares, undulati, emarginati. *Stamina* 2, corollæ tubum paullo excedentia. *Capsula* ovoidea, acuminata, 6–8 lin. longa.

The discovery of a new species of *Forsythia* in Europe was at first received with some doubts, especially as it is not at first sight so obviously different from *F. viridissima* (B. M. t. 4587) as to be at once recognized as such. It was discovered in 1897 by Dr. A. Baldacci, an experienced botanist and collector. He states that it forms extensive thickets at Simoni and Kalyvaria, in the district of Oroshi. In another place he says it is abundant in thickets in a great part of the Mirdizia (Miredita, in about 42° N. lat. and 20° E. long.), where it is well known to the inhabitants, and bears an Albanian name. We think it is specifically different from the Chinese, but several of the characters relied upon by the authors are inconstant. For instance, under cultivation the leaves are sometimes very distinctly toothed.

As to its being really indigenous in Albania, we see no reason to doubt it. Many instances exist of genera occupying widely separated areas. The allied genera *Syringa* and *Ligustrum* are common to the East and the West, and there is an another of the latter genus in Australia. It is true that both genera have less widely separated areas in Eastern Europe and Asia.

October 1st, 1905.

A more doubtful instance of isolated areas of distribution is afforded by another member of the *Oleaceæ*, *Fontanesia phillyreoides*, which is a native of South-Eastern Europe and Asia Minor, and also occurs in China, in several distant localities. It was first collected in China by Fortune upwards of fifty years ago, and it was described under the name of *F. Fortunei*. Maximowicz, however, suggests that it was introduced into China, where, especially near Shanghai, it is commonly planted for hedging. It is now undoubtedly spontaneous in the maritime provinces; but it has not, we believe, been collected in Central or Western China.

Forsythia europæa was raised at Kew from seeds obtained from Dr. Baldacci in 1899. It is of more compact habit than *F. viridissima*, but as an ornamental shrub it is not equal to *F. suspensa* (B. M. t. 4995), the only other distinct species.

F. Fortuni, Lindl. (Gard. Chron. 1864, p. 412), and *F. Sieboldii*, Dippel (Handbuch der Laubholzkunde, vol. i. p. 109) are varieties of *F. suspensa*, and *F. intermedia*, Zabel (Gartenflora, 1891, p. 397, f. 82), is described as a cross between *F. suspensa* and *F. viridissima*.

Descr.—An erect, densely branched shrub, a few feet high, glabrous or glabrescent in all parts. *Leaves* opposite, or sometimes in fours, shortly stalked, rather thick, at first pubescent, especially beneath, mostly ovate and entire, two to three inches long, lower ones of a shoot smaller, upper ones sometimes sharply toothed, all obtuse. *Flowers* yellow, appearing before the leaves, solitary, or two or three clustered, suberect, about an inch and a half across; peduncles shorter than the flowers, clothed with small, overlapping scales. *Calyx-lobes* ovate, about two lines long, slightly fringed. *Corolla-lobes* linear, undulate. *Stamens* two, slightly exceeding the corolla-tube. *Capsule* ovoid, flattened, pointed, six to eight lines long.—W. Botting Hemsley.

Fig. 1, a toothed leaf from a barren shoot; 2, part of calyx and pistil; 3, part of corolla and stamens, which are longer than the tube of the corolla:—*both of the latter enlarged.*

M.S. del, J.N. Fitch lith.

Vincent Brooks, Day & Son Ld Imp

Tab. 8040.

COLCHICUM HYDROPHILUM.

Asia Minor.

Liliaceæ.—Tribe Colchiceæ.

Colchicum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 821; *Baker in Journ. Linn. Soc.* vol. xvii. p. 423.

Colchicum hydrophilum, *Siehe in Gard. Chron.* 1901, vol. i. p. 102, fig. 43; *Irving in The Garden*, 1904, vol. i. p. 203, cum fig.; species ex affinitate *C. libanotici*, Ehrenb. (B. M. t. 8015), perianthii segmentis acutioribus obscurius roseis differt.

Cormus 1 poll. diam., tunicis atro-brunneis. *Folia* perianthii tubo æquilonga, demum 6 poll. longa, 2 poll. lata, oblongo-acuminata. *Flores* 3–5, fasciculatim dispositi, rosei. *Perianthii* tubus 3 poll. longus; lobi oblongi, subacuti, 1 poll. longi, 3 lin. lati. *Stamina* perianthii lobis dimidio breviora; filamenta media parte incrassata; antheræ luteæ, filamentis dimidio breviores. *Styli* albi, quam stamina paullo longiora. *Capsula* 3-loba; semina globosa, pallide brunnea.

Colchicum is a genus in which many of the species are separated by characters which become more or less obscured when the specimens are dried; hence the advantage of studying them in the living state, and of having them figured, as has been done in the present volume in the case of *C. libanoticum*, Ehrenb. (t. 8015), and *C. Steveni*, Kunth (t. 8025). To the former of these the present plant bears great resemblance, and might, indeed, be almost regarded as a variety with darker coloured flowers. Corms were first obtained in 1898 from the Taurus Mountains, where the plant grows at between 3,200 and 6,500 feet altitude. In this locality during part of the year, abundant moisture is provided by the melting snow, while at another period the soil is sufficiently dry to enable the corms to thoroughly ripen.

Unlike many species of the genus, *C. hydrophilum* has a somewhat prolonged flowering period, having been in flower for six weeks before our figure was taken in February last from a plant in the Alpine House at Kew, the corms of which were purchased in 1902 from Mr. W. Siehe of Mersina.

Descr.—*Corm* an inch in diameter, tunics dark brown. *Leaves* at the time of flowering as long as the perianth-

tube, finally six inches long and two inches wide, oblong, acuminate. *Flowers* in clusters of three to five, bright clear, rose-colour. *Perianth-tube* three inches long; lobes oblong, subacute, one inch long, three lines wide. *Stamens* half as long as the perianth-lobes; filaments thickened at the middle; anthers yellow, half as long as the filaments. *Styles* slightly longer than the anthers. *Capsule* three-lobed; seeds globose, light brown.—C. H. Wright.

Figs. 1 and 2, anthers :—*enlarged*.

M.S. del, J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d Imp

Tab. 8041.

MORMODES BUCCINATOR *var.* AURANTIACUM.

Tropical America.

Orchidaceæ. Tribe Vandeæ.

Mormodes, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 552; *Pfitzer in Engler & Prantl, Pflanzenf.* vol. ii. 6, p. 159.

Mormodes buccinator, *Lindl.* var. **aurantiacum,** *Rolfe in Ill. Hort.* vol. xxxix. p. 11, t. 144; a typo floribus aurantiacis differt.

Herba epiphytica, circiter pedem alta. *Pseudobulbi* fusiformi-oblongi, 2–3 poll. longi, vaginis imbricatis tecti. *Folia* oblonga vel lanceolato-oblonga, acuminata, plicata, membranacea, viridia, 3–9 poll. longa, $1\frac{1}{2}$–$3\frac{1}{4}$ poll. lata. *Scapi* basilares, erecti, 9–12 poll. longi; racemi laxi, multiflori. *Bracteæ* oblongæ, acutæ, concavæ, 2–5 lin. longæ. *Pedicelli* 1–$1\frac{1}{2}$ poll. longi. *Flores* speciosi, aurantiaci. *Sepala* elliptico-oblonga, subacuta, 10 lin. longa, incurva; lateralia basi reflexa. *Petala* sepalis similia, incurva. *Labellum* late unguiculatum, sepalis paullo brevius; limbus obliquus, late obovato-oblongus, apiculatus, valde concavus, ecristatus. *Columna* oblique torta, lata, angulata, 5 lin. longa; operculum apiculatum; pollinia per paria connata; stipes oblongus; glandula orbicularis.

Reichenbach once remarked that "*Mormodes buccinator*, Lindl., was well known as the most polychromatic Orchid of the world, and as variable in shape," and the point is very well illustrated in its history, for no less than seven forms described as species have been reduced to this species, namely, *M. brachystachya*, *M. flavidum*, *M. leucochila*, *M. marmorea*, *M. vitellina*, *M. wagneriana*, all of Klotzsch, and M. *lentiginosa*, Hook. (B. M. t. 4455). They embrace a wide range of colour, from ivory white to light green, deep yellow, brownish purple, and speckled. The variety *aurantiacum* first flowered with Messrs. Linden, at Brussels, and is recorded as having been imported from Peru. The one now figured was prepared from materials communicated by Mr. F. W. Moore, A.L.S., Keeper of the Royal Botanic Garden, Glasnevin, in February last, and it closely resembles the original in colour, though the segments are slightly more acuminate, but a comparison with allied species fails to show a nearer affinity. It was introduced by Messrs. Sander & Sons last year from an unspecified locality.

October 1st, 1905.

The other species which have been figured in this Magazine are:—*Mormodes Pardina*, Batem. (t. 3900); its variety *unicolor*, Hook. (t. 3879); *M. Cartoni*, Hook. (t. 4214); *M. atropurpurea*, Hook. (t. 4577); *M. Greenii*, Hook. (t. 5802); *M. Colossus*, Rchb. f. (t. 5840); *M. Ocannæ*, Linden & Rchb. f. (t. 6496), and *M. rolfeanum*, L. Lind. (t. 7438).

Descr.—A densely tufted epiphyte, about a foot high. *Bulbs* oblong, more or less conical, fleshy, two to three inches long, clothed with the broad imbricating leaf-sheaths. *Leaves* oblong or lanceolate-oblong, acuminate, plicate, membranous, bright green, about three to nine inches long, one and a quarter to one and three-quarter inches broad. *Scapes* basal, erect, about nine inches to a foot high; raceme lax, many-flowered. *Bracts* oblong, acute, somewhat concave, two to five lines long. *Pedicels* an inch to an inch and a half long. *Flowers* medium-sized, somewhat globose, and deep orange-yellow throughout. *Sepals* elliptic-oblong, subacute, about ten lines long, somewhat incurved, and the lateral pair more or less reflexed at the base. *Petals* very similar to the sepals in shape, incurved. *Lip* broadly clawed, rather shorter than the sepals; limb obliquely twisted, broadly obovate-oblong, apiculate, very concave, without crests. *Column* obliquely twisted, broad, with two rather sharp angles, about five lines long; anther-case apiculate; pollinia four, connate in two pairs, attached to an oblong stipes and circular gland.—R. A. Rolfe.

Figs. 1, lip and column; 2, anther-case; 3 and 4, pollinarium, seen from front and back:—*all much enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 8042.

STREPTOCARPUS GRANDIS.

Zululand.

Gesneraceæ. Tribe Cyrtandreæ.

Streptocarpus, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1023.

Streptocarpus grandis, *N. E. Brown* (sp. nov.); ex affinitate *S. Saundersii*, a quo folio multo majore, floribus longioribus angustioribus et tubo cæruleo differt.

Herba acaulescens. *Folium* unicum radicale, 2–3½ ped. longum, 1–2¼ ped. latum, ovatum, basi cordatum, crenatum, utrinque pubescens; folia caulina nulla vel pauca, parva, ovata, sessilia. *Pedunculi* plures, 1½–3½ ped. alti, superne in racemos 2–6 elongatos laxos furcati, pubescentes. *Flores* bini. *Bracteæ* parvæ, lineari-subulatæ, acutæ. *Pedicelli* 6–10 lin. lin. longi, patentes. *Sepala* 1½–2½ lin. longa, subulata, acuta, ut pedicelli pilis simplicibus et glanduliferis pubescentia. *Corollæ* tubus 1 poll. longus, ad medium decurvatus, subcylindricus, superne ampliatus, minute glanduloso-pubescens, cæruleus, fauce violacea late bivittata; limbus obliquus ¾ poll. diam., lobis oblongis obtusis 2 posticis cæruleis, 3 anticis pallidioribus discis albidis ornatis. *Stamina* inclusa; filamenta 2 lin. longa, superne incrassata, glabra; antheræ subreniformes, cohærentes, albidæ; staminodia minuta. *Ovarium* teres, patenter pubescens; stylus inclusus; stigma capitatum, transversum. *Capsula* 3–3½ poll. longa, torta, pubescens.

Once again the genus *Streptocarpus* has furnished our gardens with an ornamental plant, which in size of leaf and height of flower-stems is perhaps the largest known of the genus. In the size of its leaf it may be compared with *S. Dunnii* (*Bot. Mag.* t. 6903), *S. Wendlandii* (*Bot. Mag.* t. 7447), and *S. Saundersii* (*Bot. Mag.* t. 5251), to which latter species it is most nearly allied, although very much larger in its foliage and more floriferous, besides differing in the longer and narrower blue tube and smaller limb of its corolla. It was discovered in Zululand by Mr. W. J. Haygarth, together with a very much smaller species (*S. Haygarthii*, N. E. Br.). A dried specimen of the latter was sent to Kew by Mr. J. Medley Wood, Director of the Botanic Garden at Durban, Natal, to whom Kew is indebted for a very large collection of Natal plants. Mingled with it was a portion of a large leaf belonging to the plant now described. Unfortunately when publishing *S. Haygarthii* in the *Flora Capensis*, Mr. C. B. Clarke mistakenly supposed "the herbarium frag-

ment 26 in. wide," mentioned in the description, to belong to *S. Haygarthii*, in which the leaves are only six to ten inches long and four to six and a half inches wide at the most. From this cause we learn from Mr. Wood that seeds of the large leaved plant were sent as *S. Haygarthii* by Mr. Wood to Mr. W. E. Ledger, of Wimbledon, who presented some to the Royal Botanic Gardens, Kew, in 1904, from which the plant here figured was raised, and flowered this year from May to July.

Descr.—Stemless. *Leaf* solitary, spreading on the ground, two to three and a half feet long, one to two and a quarter feet broad, ovate, cordate at the base, crenate, somewhat harshly pubescent on both sides with short, stiff, erect hairs, bright deep green; veins impressed above, very prominent beneath. *Flower-stems* numerous, one and a half to three and a half feet high, forking above into two to six elongating, lax racemes, pubescent like the leaf, purplish-brown. *Flowers* in pairs. *Bracts* very small, long, linear-subulate, acute. *Pedicels* half to three-quarters of an inch long, spreading, pubescent with simple and gland-tipped hairs. *Sepals* about one-sixth of an inch long, subulate, acute, erect, pubescent like the pedicels. *Corolla-tube* about one inch long, slightly curved downwards at the middle, subcylindric, pubescent with minutely gland-tipped hairs, light blue outside, white within, marked with two broad violet stripes in the throat; limb oblique, about three-quarters of an inch across; lobes oblong, rounded, the two upper equal, light blue, the three lower unequal, paler blue with whitish disks. *Stamens* included; two perfect on the lower side of the tube, three rudimentary and antherless on the upper side; filaments of the perfect stamens very short, glabrous, white; anthers subreniform, cohering, glabrous, whitish. *Ovary* with style included, terete, pubescent with spreading, jointed, sharp-pointed hairs (not gland-tipped, as represented on the plate); stigma capitate, transverse. *Capsule* three to three and a half inches long, about one line thick, twisted, harshly pubescent with simple hairs.—N. E. Brown.

Fig. 1, portion of a leaf; 2, calyx and pistil; 3, corolla laid open; 4 and 5, anthers: *all enlarged*; 6, whole plant: *much reduced*.

M.S. del. J.N. Fitch lith.

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Tab. 8043.

PRIMULA tangutica.

China.

Primulaceæ. Tribe Primuleæ.

Primula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula (§ Proliferæ) **tangutica**, *Duthie in Gard. Chron.* 1905, vol. xxxviii. p. 42, fig. 17; ex affinitate *P. Maximowiczii*, a qua calycis lobis longioribus et corollæ lobis angustissimis differt.

Herba perennis, præter inflorescentiam glabra, rhizomate brevi crasso. *Folia* omnia radicalia, 2–4½ poll. longa, subcoriacea, glabra, anguste oblanceolata, obtusa vel subacuta, basi in petiolum alatum attenuata, marginibus remote et minute denticulatis; costa crassa, nervis lateralibus obscuris. *Scapus* robustus, teres, 1–3 ped. altus, apice tantum puberulus. *Flores* verticillati, cernui, odorati; bracteæ lineari-lanceolatæ, pedicellis breviores, supra canaliculatæ; pedicelli 3–9 lin. longi, puberuli. *Calyx* quam corollæ tubus brevior, inæqualiter 5-lobus, extra glaber, intra farinoso-puberulus; lobi tubum subæquantes, triangulari-lanceolati, acuti, marginibus ciliatis, vel minute denticulatis. *Corolla* 9–10 lin. diametro, fusco- vel atro-purpurea; tubus 4–6 lin. longus, ore annulo pentagono instructus; lobi reflexi, anguste ligulati. *Stamina* inclusa, medio tubi affixa; filamenta brevissima, infra dilatata. *Ovarium* subglobosum, stigma hemisphæricum, apice depressum. *Capsula* matura oblongo-cylindrica, calycem excedens. —*Primula Maximowiczii*, Regel, var. *tangutica*, Maxim. in Herb. Hort. Petrop. et Kew.

Amongst the many Primulas already known from Eastern Asia this species is chiefly remarkable for the peculiar colour of the flowers. It is most nearly related to *P. Maximowiczii*, from which it differs by its narrower leaves, longer calyx-lobes, and by the very narrow segments of the corolla. Specimens of this plant were first collected in 1880 by Przewalski in the Kansu province of N.W. China, and afterwards by Soulié (no. 951) at Tongolo in Eastern Tibet. The plant here figured was raised by Messrs. J. Veitch & Sons from seed collected by Mr. E. H. Wilson, who found it growing abundantly in open grassy places at elevations between 11,000 and 13,000 feet. The flowers have a strong scent resembling that of *Jasminum Sambac*.

Descr.—A perennial herb with a short, thick rootstock, quite glabrous, except on portions of the inflorescence. *Leaves* all radical, sub-coriaceous; blade two to five inches long, narrowly oblanceolate, obtuse or subacute, tapering

gradually into the winged petiole; margins remotely and minutely denticulate; midrib stout; veins obscure. *Scape* up to three feet high, rather stout, minutely puberulous near the top. *Flowers* in verticils of five to nine, drooping, sweet-scented; bracts linear-lanceolate, shorter than the pedicels, channelled above. *Calyx* two-fifths of an inch long, shorter than the tube of the corolla, glabrous outside, minutely puberulous and farinose within; lobes about as long as the tube, triangular-lanceolate, somewhat unequal, margins ciliate or minutely denticulate. *Corolla* four-fifths of an inch across, dark brownish purple; tube about half an inch long, the mouth surrounded by a raised pentagonal ring; lobes reflexed, narrowly ligulate. *Stamens* one-tenth of an inch long; filaments very short, dilated downwards. *Ovary* subglobose, stigma hemispherical, with a depressed apex. *Capsule* oblong-cylindrical, projecting above the calyx.—J. F. Duthie.

Fig. 1, portion of leaf; 2, section of calyx with pistil; 3, a corolla laid open; 4, pistil:—*all enlarged.*

M. Jones del. M. Foster lith.

Vincent Brooks, Day & Son Lt.d Imp

Tab. 8044.

LISSOCHILUS Ugandæ.

Uganda.

Orchidaceæ. Tribe Vandeæ.

Lissochilus, *R. Br.*: *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 536.

Lissochilus Ugandæ, *Rolfe* (*sp. nov.*); affinis, *L. lato*, Rolfe, sed sepalis longioribus, petalis fere dimidio angustioribus, labelli lobo intermedio vix undulato et sacco latiore distincta.

Herba terrestris, tuberosa. *Folia* elongata, ligulata, subacuta, plicata, 2–3 ped. longa, 1 poll. lata. *Scapus* erectus, 3½ ped. altus, vaginis 4 tubulosis tectus. *Racemus* compactus, 6–8 poll. longus, multiflorus. *Bracteæ* oblongo-lanceolatæ, acutæ, concavæ, ½ poll. longæ. *Pedicelli* 9–11 lin. longi. *Flores* speciosi, flavi, sepalorum apicibus brunneo suffusis, labelli lobis lateralibus brunneo-lineatis. *Sepala* reflexa, spathulato-oblonga, obtusa, concava, circa 1 poll. longa. *Petala* incurva, elliptico-oblonga, obtusa, 10 lin. longa. *Labellum* trilobum, 1 poll. longum; lobi laterales erecti, oblongi, obtusi, apice undulati; lobus intermedius orbiculari-oblongus, obtusus, lateribus reflexis leviter undulatis; discus ad basin 3-carinatus, carinis crenulatis; saccus latissimus, obtusus, fere 3 lin. latus. *Columna* clavata, angulata, circa 6 lin. longa.

Lissochilus is a large and characteristic African genus, which, unlike the allied genus *Eulophia*, does not extend its range through the eastern tropics. Over ninety species are now known, about eighty of which are limited to Tropical Africa, though a few extend south of the tropic, where several additional species occur, and there are four or five imperfectly known Mascarene representatives. Many of the species are strikingly handsome, though, owing to their large size and deciduous, terrestrial habits, they are not very common in cultivation. One of them ranks among the giants of the Order, namely, *L. giganteus*, Welw., which, according to Sir Harry Johnston, sometimes produces an inflorescence as much as sixteen feet high, and plants have reached half this height in cultivation. Five species have already been figured in this work, namely, *L. Horsfallii*, Batem. (t. 5486), *L Krebsii*, Rchb. f. (t. 5861), *L. Sandersoni*, Rchb. f. (t. 6858), *L. milanjianus*, Rendle (t. 7546), and *L. purpuratus*, Lindl. (t. 7921). The genus is polymorphic,

and the flowers show a range of colour from yellow to various shades of lilac and purple, sometimes intermixed with green.

Lissochilus Ugandæ, Rolfe, is an interesting addition, which was sent to Kew, in 1902, by Mr. John Mahon, then Curator of the Botanic Gardens at Entebbe, Uganda, and flowered in a tropical house in April, 1905.

Descr.—A terrestrial, tuberous herb with *Phaius*-like habit. *Leaves* elongate, ligulate, subacute, plicate, two to three feet long by about an inch broad, glaucous green. *Scape* rather stout, three feet and a half high, with about four sheaths, from an inch to an inch and a half long, and tubular at the base; raceme compact, six to eight inches long, bearing about two dozen flowers. *Bracts* oblong-lanceolate, acute, about half an inch long, concave. *Pedicels* three-quarters to an inch long. *Flowers* about two inches long, yellow, suffused with purple-brown at the apex of the sepals, and lined with light brown on the side lobes of the lip. *Sepals* reflexed, spathulate-oblong, obtuse, concave, an inch or more long. *Petals* incurved over the lip, elliptic-oblong, obtuse, rather shorter than the sepals. *Lip* strongly three-lobed, an inch long; side lobes erect, oblong, obtuse and undulate at the apex; front lobe orbicular-oblong, obtuse, reflexed, and undulate at the sides; disk with three nearly parallel keels extending to the base, thicker, and crenulate in front; sac very broad and obtuse, about a quarter of an inch long. *Column* clavate, acute-angled, about half an inch long.—R. A. Rolfe.

Fig. 1, lip and column; 2, anther cap; 3 and 4, pollinarium, front and back view:—*all enlarged.*

M.S.del J.N.Fitch lith.

Vincent Brooks Day & Son Ltd Imp

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Tab. 8045.

ERICA australis.

S.W. Europe and N.W. Africa.

Ericaceæ. Tribe Ericeæ.

Erica, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 590.

Erica australis, *Linn. Mant. alt.* p. 231; *Ait. Hort. Kew.* ed. 1, vol. ii. p. 19; *Benth. in D.C. Prodr.* vol. vii. p. 666; *Andr. Heaths*, t. 52; species inter affines antherarum cristis unilateraliter serratis insignis.

Frutex ramosissimus, usque ad 6–7 ped. altus, ramis gracilibus nigro-pubescentibus. *Folia* quaterna, vix semipollicaria, patentia, arcte recurva. *Flores* rubro-purpurei, 3–4 lin. longi, 4–6 in ramulorum apicibus conferti, brevissime pedicellati. *Bracteolæ* puberulæ, sepalis simillimæ et illis arcte approximatæ. *Corolla* cylindrica, lobis 4 rotundatis reflexis. *Antheræ* basifixæ, atrorubræ, brevissime exsertæ, basi cristatæ. *Discus* crenatus. *Ovarium* puberulum; stylus glaber, distincte exsertus, stigmate capitato.—*E. protrusa*, Salisb. Prodr. Stirp. in Hort. Chap. Allert. Vig. (1796), p. 293. *E. pistillaris*, Salisb. in Trans. Linn. Soc. vol. vi. (1802), p. 368. *E. aragonensis*, Willk. in Linnæa, vol. xxv. p. 46. *E. umbellata*, Asso, Syn. Arag. p. 49.

Aiton, who calls this the "Spanish Heath," records it as having been introduced into cultivation in this country by George, Earl of Coventry, in 1769, and Salisbury had it in his garden at Chapel Allerton in 1796; but it is still rare in gardens, though one of the prettiest of the hardy species. This may be due to its being unable to withstand our severest winters, which one might expect from its geographical distribution. The present plantation at Kew has only been in existence since 1896, so that it has not passed through a season of extreme cold. It is recorded as attaining a height of six or seven feet, but is usually a bush about half that height. Like most of the heaths, it begins flowering when quite young, and it continues in flower from April to July. It is a free grower, and perhaps the most ornamental of the out-door species; the brightness of the colour of its flowers being its special attraction. In structure *E. australis* comes nearer our native *E. Tetralia* and *E. cinerea* than it does to the southern *E. arborea* and *E. lusitanica*.

Descr.—A densely branched shrub, sometimes six or seven feet high, but usually less. *Branches* very slender,

clothed with a black tomentum. *Leaves* in fours, about half an inch long, spreading at nearly right angles, margins closely recurved. *Flowers* bright purple-red, about a third of an inch long, borne in clusters of four to six at the ends of the branches, very shortly stalked. *Bracteoles* similar to the sepals, and closely applied to them, presenting the appearance of a double calyx. *Corolla* cylindrical; lobes four, rounded, recurved. *Anthers* deep red, slightly exserted, crested at the base. *Style* slightly overtopping the stamens.—W. Boiting Hemsley.

Fig. 1, a whorl of leaves; 2, a flower; 3 and 4, stamens; 5, disk and pistil:—*all enlarged.*

M. S. del. J.N. Fitch lith

Vincent Brooks Day & Son Ltd. Imp

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Tab. 8046.

ASPARAGUS madagascariensis.

Madagascar.

Liliaceæ. Tribe Asparageæ.

Asparagus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 765.

Asparagus madagascariensis, *Baker in Journ. Linn. Soc.* vol. xvi. p. 206; species *A. scandenti*, Thunb., accedens, caule erecto differt.

Frutex erectus, ramosus. *Rami* tenues, rigidi, valde 5-costati. *Folia* ad spinas breves latas recurvas reducta. *Phylloeladia* ternata, oblanceolata vel fere oblonga, leviter obliqua, cuspidata, 6 lin. longa, $1\frac{1}{2}$ lin. lata. *Flores* dilute lutei, ad apices ramulorum ternatim dispositi, 3 lin. diam.; pedicelli prope medium articulati. *Perianthii segmenta* elliptica, obtusa. *Stamina* perianthio æquilonga. *Ovarium* distincte 3-lobatum; stylus ovario æquilongus, breviter 3-ramosus. *Bacca* 3-lobata, 6 lin. diam., rubra.

This plant, which was received at Kew in 1903 from the Museum d'Histoire Naturelle, Paris, under the name of *Asparagus ruscifolius*, produced an abundant crop of fruit in a tropical house in March last, and again flowered in May. Unlike most of the species of *Asparagus* grown for decorative purposes, it is not a climber, but an erect shrub with the appearance of a narrow-leaved form of *Ruscus aculeatus*, Linn. The plant here figured was not much over a foot high, but in a note on a herbarium specimen collected by Dr. G. W. Parker, it is said to attain a height of twelve feet. The type specimen was collected nearly thirty years years ago at Antananarivo by Miss Helen Gilpin, of the Friends' Foreign Mission Association, and was erroneously described as a climber. Since then the species has been found in Central Madagascar by several other collectors.

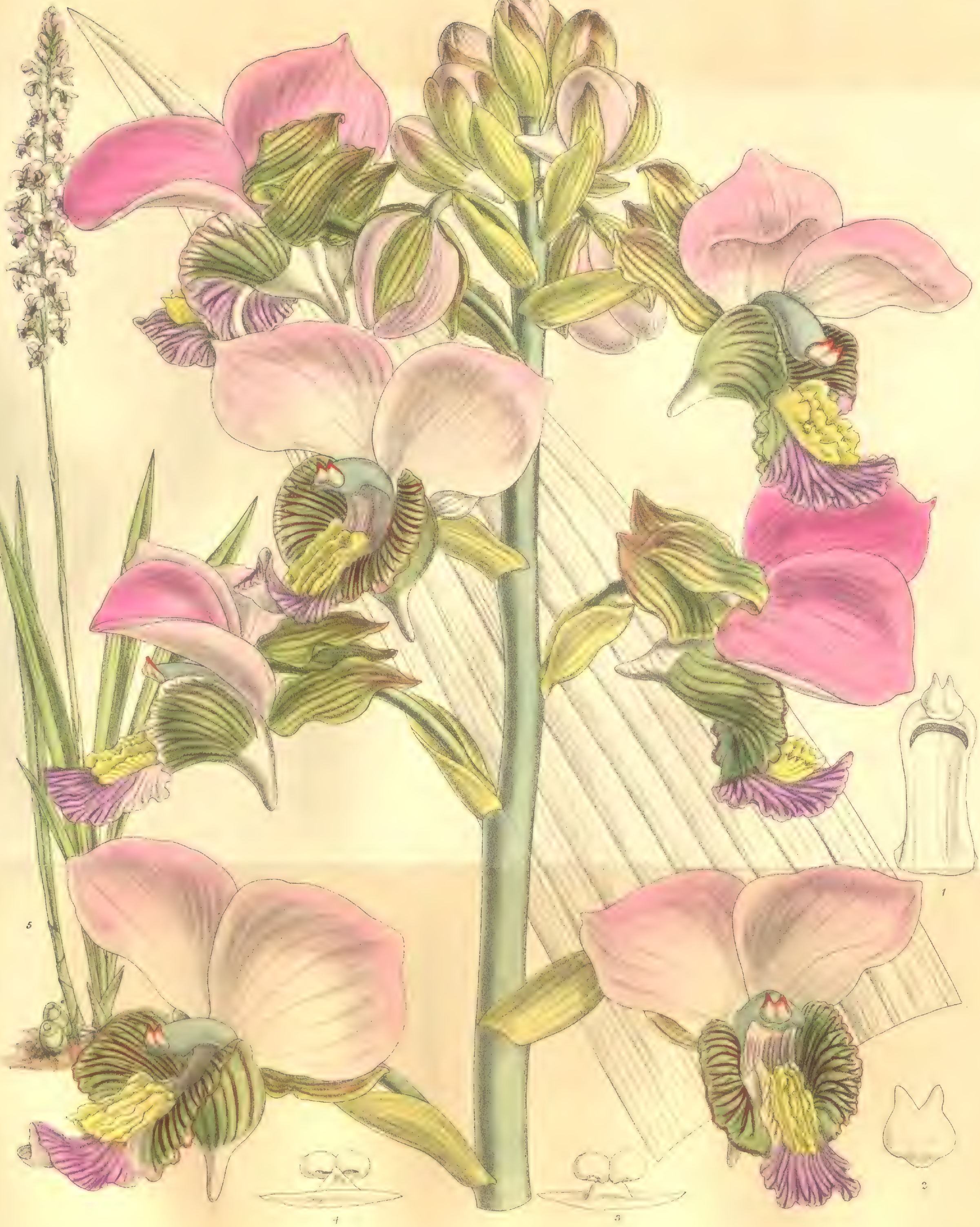
Descr.—An erect much-branched shrub. *Branches* slender, rigid, with about five prominent longitudinal ridges. *Leaves* developed as short, broad, recurved spurs. *Phylloclades* ternate, oblanceolate, or nearly oblong, slightly oblique, cuspidate, half an inch long, an eighth of an inch broad. *Flowers* yellowish, in fascicles of three at the ends of the branchlets, quarter of an inch in diameter; pedicels articulated near the middle. *Perianth-segments*

elliptic, obtuse. *Stamens* nearly as long as the perianth. *Ovary* distinctly three-lobed; style nearly as long as the ovary, shortly three-branched. *Berry* three-lobed, half an inch in diameter, crimson.—C. H. Wright.

Fig. 1, portion of a branchlet bearing a leaf-spur; 2, the same, showing the insertion of three phylloclades; 3 flowers; 4, pistil:—*all enlarged*.

Note to Tab. 8029.

By a clerical error, *Impatiens Holstii* is stated to have been purchased for Kew in 1894. This antedates its introduction by ten years. It should have been 1904.



M. S del. F.N. Fitch lith.

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Tab. 8047.

LISSOCHILUS Mahoni.

Uganda.

Orchidaceæ. Tribe Vandeæ.

Lissochilus, *R. Br.*; *Benth et Hook. f. Gen. Plant.* vol. iii. p. 536; *Rolfe in Thiselton-Dyer Fl. Trop. Afr.* vol. vii. p. 70.

Lissochilus Mahoni, *Rolfe* (*sp. nov.*); affinis *L. giganteo*, Rchb. f., labelli lobis lateralibus viridibus brunneo-striatis, carinis magis validioribus distinctus.

Herba terrestris, elata, decidua, habitu *Phaiorum* majorum. *Folia* lanceolata, acuminata, basi multo attenuata, plicata, $4\frac{1}{2}$–$5\frac{1}{2}$ ped. longa, $3\frac{1}{2}$–4 poll. lata, viridia. *Scapi* validi, erecti, 6–8 ped. alti, infra medium vaginis tubulosis obtecti; racemi compacti, multiflori. *Bracteæ* ovato-oblongæ, acuminatæ vel obtusæ, convolutæ, $\frac{3}{4}$–$1\frac{1}{2}$ poll. longæ, supra gradatim abbreviatæ. *Pedicelli* $1\frac{1}{2}$–$1\frac{3}{4}$ poll. longi. *Flores* speciosi, diametro maximo circiter tripollicares. *Sepala* reflexa, obovato-oblonga, breviter acuminata, circiter 1 poll. longa, viridia, brunneo-suffusa. *Petala* ovato-orbicularia, subobtusa vel obscure apiculata, circiter $1\frac{1}{4}$ poll. longa, roseo-lilacina. *Labellum* trilobum, circiter $1\frac{3}{4}$ poll. longum; lobi laterales erecti, late rotundati, crenulati, virides, intus venis brunneis paullo incrassatis radiati; lobus medius patens, oblongus, obtusus, lateribus reflexis et crenulatis, basi viridis, fronte purpurea, venis atro-purpureis; discus tricarinatus; calli validi, undulati, denticulati, pallide virides, basi subattenuati; calcar conicum, circiter $\frac{1}{2}$ poll. longum. *Columna* clavata, 9 lin. longa.

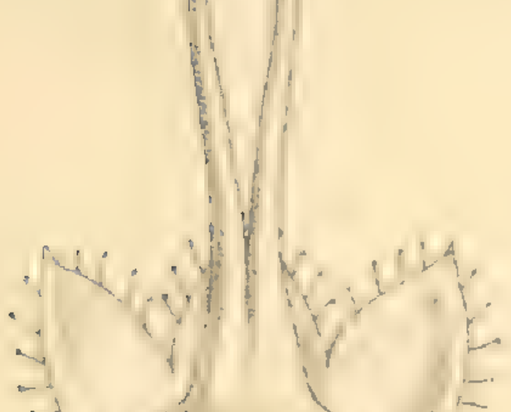
Lissochilus Mahoni is a remarkable novelty, which was discovered by Mr. John Mahon, Curator of the Botanic Garden at Entebbe, Uganda, and sent to Kew in 1902. It flowered in a tropical house in April, 1905, and for several weeks formed a conspicuous object, standing above the tank of the Victoria House. It is a plant of large dimensions, its scape reaching a height of eight feet, almost rivalling its near ally *L. giganteus*, Rchb. f., one of the giants of the family, which is an ornament of the muddy shores of the Congo basin, as described by Sir H. H. Johnston in his work on the River Congo, published in 1884.

The group of species to which the two species mentioned belong is characterized by having broad or ovate bracts, and purple or lilac, occasionally white, petals, and comprises about fourteen known species, all of them plants of large size. Three others are, or have been, in cultivation,

namely, *L. Horsfallii*, Batem. (*Bot. Mag.* t. 5486), *L. Sandersoni*, Rchb. f. (*l.c.*, t. 6858), and *L. roseus*, Lindl. (*Bot. Reg.* 1844, t. 12).

Descr.—A deciduous terrestrial Orchid of *Phaius*-like habit. *Leaves* lanceolate, acuminate, much attenuate at the base, plicate, four and a half to five and a half feet long, three and a half to four inches broad, bright green. *Scape* stout, erect, ultimately over eight feet high, with about four tubular sheaths, two to three inches long, below the middle, and bearing at the apex a compact raceme of about three dozen flowers. *Bracts* ovate-oblong, acuminate or subobtuse, convolute, lower an inch and a half long, upper shorter. *Pedicels* one inch and a half to one and three-quarters long. *Flowers* among the largest in the genus. *Sepals* reflexed, obovate-oblong, shortly acuminate, about an inch long, green, suffused, and somewhat veined with brown. *Petals* ovate-orbicular, subobtuse or obscurely apiculate, about an inch and a quarter long by nearly as broad, rosy lilac, slightly darker behind. *Lip* three-lobed, about an inch and three-quarters long; side lobes erect, broadly rounded, crenulate, green, with thickened, radiating brown nerves inside; front lobe spreading, oblong, obtuse, reflexed at the sides, crenulate, purple in front, with darker nerves, passing into green at the base; disc bearing three tall undulate, denticulate, whitish-green, parallel keels, two-thirds of the way up, the middle much dwarfer towards the base; spur conical, half an inch long. *Column* clavate, about nine lines long. *Capsule* elliptical-oblong, obtusely ribbed at the three angles, somewhat verrucose and glaucous, two and a half inches long.—R. A. Rolfe.

Fig. 1, column; 2, anther case; 3 and 4, pollinarium, seen from front and back; 5, sketch of whole plant:—1–4, *enlarged*, 5, *much reduced*.



2

4

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1

M.S. del. J.N. Fitch lith.

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Tab. 8048.

X. SAXIFRAGA APICULATA.

Of Garden Origin.

Saxifragaceæ. Tribe Saxifrageæ.

Saxifraga, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 635.

Saxifraga apiculata, *Engl. in Gard. Chron.* 1894, vol. i. p. 556, t. 68; *Mottet in Rev. Hort.* 1902, p. 231, t. 91; *W. S. in Journ. Hort.* Ser. iii. vol. xliv. p. 186; stirps quoad folia ad *S. sanctam,* Griseb., quoad flores ad *S. aretioidem,* Lapeyr. spectans.

Planta cæspitosa, caudiculis sublignosis, densissime foliatis. *Folia basalia* lineari-oblonga, acute cuspidata, 4–6 lin. longa, 1 lin. lata, leviter carinata, crassa, usque ad medium vel altius ciliata, apice et margine cartilaginea, apice foveola 1, utroque margine foveolis 3–5 instructa. *Caules floriferi* 2–3½ poll. longi, glanduloso-pilosi, 5–9-flori, ramulis 1–2-floris. *Folia caulina* subspathulata, circiter 3 lin. longa. *Calycis tubus* turbinatus, 1 lin. longus, dense glanduloso-pilosus; lobi ovato-oblongi, apiculati, 1½ lin. longi, glanduloso-ciliati. *Petala* obovata, 3½ lin. longa, 2 lin. lata, patentia. *Filamenta* subulata, 2½ lin. longa. *Antheræ* suborbiculares, basi cordatæ. *Ovarium* semi-inferum, stylis leviter divergentibus, 2 lin. longis, stigmatibus capitellatis.—*S. Malyi,* X, Hort. ex Gard. Chron. 1894, i. 556. *S. luteo-purpurea,* Hort. *l.c.*, non aliorum.

Saxifraga apiculata is a plant of somewhat uncertain parentage, it is stated, on the authority of the Rev. C. Wolley Dod, to have been raised by the late Mr. Franz Maly, Curator of the Imperial Gardens, Belvedere, near Vienna, by crossing *S. Friderici-Augusti* and *S. sancta,* but experimental verification is desirable. *S. apiculata* is a plant of vigorous growth, and flowers in the months of February and March, considerably earlier than most of the genus, and is especially valuable on that account as a greenhouse plant. There is a fine patch of *S. apiculata* in the Rock Garden at Kew, where it flowers freely, but does not produce perfect capsules, a fact tending to confirm its hybrid origin. The plant figured flowered in the Alpine House in March of the present year.

Descr.—A tufted plant. *Stems* rather woody, very leafy. *Basal leaves* linear-oblong, sharply cuspidate, about half an inch long, slightly keeled, ciliate for at least the lower half, with a row of seven to eleven pits on the upper surface inside the cartilaginous margin. *Flowering stems* two to three and a half inches long, glandular-hairy, five- to nine-flowered. *Cauline leaves* subspathulate, about a

fourth of an inch long. *Calyx-tube* turbinate, a twelfth of an inch long, densely glandular-hairy; lobes ovate-oblong, apiculate, glandular-ciliate. *Petals* pale yellow, obovate, about a third of an inch long, spreading.—T. A. Sprague.

Fig. 1, leaf; 2, calyx and pistil; 3 and 4, anthers:—*all enlarged.*

M.S. del J.N. Fitch lith.

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Tab. 8049.

FELICIA echinata.

South Africa.

Compositæ. Tribe Asteroideæ.

Felicia, *Cass.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 274; *Harv. in Harv. et Sond. Fl. Cap.* vol. iii. p. 69, sub Astere.

Felicia echinata, *Nees, Gen. et Sp. Aster.* p. 216; *DC. Prodr.* vol. v. p. 222; ab affini *F. reflexa*, DC. (Bot. Mag. t. 884) floribus radii cæruleis, achæniis disci pilosis pappoque differt.

Fruticulus 1–2 ped. altus. *Rami* erecti, dense foliati, longiuscule pilosi. *Folia* sessilia, patula vel ± deflexa, oblongo-lanceolata, pungenti-apiculata, basi angustata, 4–10 lin. longa, 1½–3 lin. lata, longiuscule ciliata (rarius nuda), obscure pellucido-punctata. *Pedunculi* solitarii terminales vel plures corymbosi, sparse foliati. *Involucri bracteæ* lanceolato-oblongæ, acuminatæ, pellucido-marginatæ, dense ciliolatæ, extra glabræ vel ± hispidæ. *Flores radii*: tubus 1–1½ lin. longus, superne, ut ligulæ basis, extra sparse pilosus; ligula 4–5 lin. longa, ¾–1 lin. lata, apice tridentata. Achænia glabra; pappi setæ 1½–2 lin. longæ, inconspicue barbellatæ. *Flores disci*: tubus 1½–2 lin. longus, extra glaber (vel supra minutissime puberulus); lobi ⅜ lin. longi, ¼ lin. lati. Achænia subappresse pilosa; pappus florum radii.—*Felicia Paralia*, DC. Prodr. vol. v. p. 222. *Pteronia echinata*, Thunb. Fl. Cap. p. 629. *Aster echinatus*, Less. Syn. Comp. p. 177; Harv. in Harv. & Sond. Fl. Cap. vol. iii. p. 77.

Felicia echinata has been grown in the Temperate House at Kew for many years, but does not seem to have been recorded hitherto as cultivated in Europe. As grown at Kew formerly, *F. echinata* was a loose, straggling, few-flowered shrub, but it has now, by repeated cutting-back, been made to assume a compact form, and to flower freely in spring.

Harvey (*Fl. Cap.* vol. iii. p. 77) distinguished two varieties, α. *echinata* proper and β. *Paralia* (*Felicia Paralia*, DC.), differing chiefly in the hairiness of the involucral bracts, but it seems undesirable to keep up his varieties, since they are connected by intermediate forms, as he himself admitted.

The fact of the disc achenes of *F. echinata* being pilose was not noticed by De Candolle, who, followed by Harvey, placed the species in a section with glabrous achenes.

Descr.—A small shrub, one to two feet high. *Branches* erect, very leafy, covered with longish hairs. *Leaves*

sessile, spreading, or deflexed, oblong-lanceolate, with pungent apex, narrowed towards the base, a third to three-quarters of an inch long, a ninth to a quarter of an inch broad, ciliate, rarely naked, with very obscure pellucid dots. *Peduncles* with scattered bract-like leaves, solitary and terminal, or several in a corymb. *Bracts of the involucre* lanceolate-oblong, acuminate, with pellucid margins, densely ciliate, glabrous, or more or less hispid outside. *Ray-flowers lilac*—corolla-tube about a twelfth of an inch long, pilose outside, towards the top; ligule about a third of an inch long, about a twelfth of an inch broad, three-toothed at the apex. *Achenes* glabrous; pappus inconspicuously barbulate. *Disc flowers yellow*—Achenes pilose, with subappressed hairs; pappus like that of the ray.—T. A. Sprague.

Fig. 1, leaf, 2, a ray-floret; 3, pappus; 4, a disc-floret; 5, anthers; 6, style-arms:—*all enlarged.*

M S del J N Fitch lith

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Tab. 8050.

SCIADOPITYS verticillata.

Japan.

Coniferæ. Tribe Taxodieæ.

Sciadopitys, *Sieb. & Zucc.*: *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 437.

Sciadopitys verticillata, *Sieb. & Zucc. Fl. Jap.* vol. ii. p. 1, tab 1, 2; species unica.

Arbor excelsa, sempervirens, pyramidalis, ramis patentibus. *Folia* squamosiformia, deltoidea. *Cladodia* prope apices ramulorum verticillata, horizontaliter expansa, foliiformia, linearia, rigida, apice obtusa, brevissime bifida, supra saturate viridia, nitida, leviter sulcata, infra sulco profundo niveo prædita. *Flores masculini* ovoidei, in racemum congestum terminalem subsessilem bracteis paucis membranaceis brevibus suffultum aggregati. *Stamina* late oblonga, apice acuto reflexo. *Loculi* 2, penduli, oblongi, rima longitudinali dehiscentes. *Pollen* globosum, minute tuberculatum. *Strobilus* femineus ad 3 poll. longus, $1\frac{1}{2}$ poll. latus, terminalis, deinde innovatione accrescente lateralis, cladodiis prolatis sæpe coronatus, crassus, ovoideo-oblongus, breviter pedunculatus, pedunculo bracteis paucis membranaceis prædito. *Squama* ovulifera majuscula, bracteæ breviori membranaceæ apice acuto reflexo adnata, orbiculari-rhomboidea, carnosa, infra viridis, margine brunneo. *Ovula* 6-9, compressa.—*Taxus verticillata*, Thunb. Fl. Jap. 276. *Pinus verticillata*, Sieb. in Verhand. v. h. Batav. Genootsch. vol. xii. p. 12.

Sciadopitys, like *Gingko*, stands alone amongst *Coniferæ*, with no obvious affinities or immediate allies. Both, it must therefore be conjectured, come down to us from a remote geological past, which has obliterated all trace of their immedate ancestors or contemporary congeners. It is a native of Japan, where it was long only known to botanists from a few individuals cultivated in temple-gardens. Professor Sargent, however, found it forming forests on mountains in the Province of Mino, where it attains the height of 100 feet, and its timber is an article of commerce.

It was first made known to European botanists by Thunberg, who saw it in cultivation during his visit to Japan (1775-6). As he supposed it to be a species of yew with which it has not the slightest affinity, it is clear that he could not have seen the cone. Siebold first accurately described it in 1842, and gave it a scientific name which is a literal translation of "Umbrella Pine,"

as it is called in Japanese, on account of the shoots, which serve as leaves, spreading out like the ribs of an umbrella. The first plant which reached Europe was obtained by Thomas Lobb in 1853 from the Buitenzorg Botanic Garden, to which, owing to Dutch influence, many Japanese plants had been introduced. This did not long survive, but in 1861 Mr. John Gould Veitch brought seeds from Japan, and about the same time they were obtained by Robert Fortune.

The figure is from the oldest plant in the Kew Pinetum. It was probably obtained, as were many subsequent specimens, from Messrs. Veitch. Although the second largest recorded specimen in the country, it grows very slowly, and has only attained the height of fifteen feet.

Sciadopitys is of peculiar interest to botanists on account of the anomalous character of what, for want of a better term, must be called its "foliage." This at first sight consists of "leaves" not unlike those of a Pine. They are, however, really leaf-like shoots (*cladodia*) produced in the axils of the true leaves, which are reduced to mere membranous scales. This was first pointed out by the late Alexander Dickson (Report of the London Botanical Congress, 1866, p. 124). It was confirmed by the interesting observations of Carrière (Rev. Hort. 1868, pp. 150-151) who met with a case in which they divided, and produced secondary tufts of leaf-like organs, behaving, in fact, like true branches. The problem was discussed on anatomical grounds by Von Mohl in 1871, in the last paper published by that eminent botanist. He arrived at the conclusion, in which he has been generally followed, that the cladode of *Sciadopitys* is an axillary shoot or branch with two coherent leaves.

The systematic position of *Sciadopitys* amongst *Coniferæ* is not easily defined, and must probably remain more or less artificial. Bentham and Hooker include it amongst the *Araucarieæ*, from which it is aberrant, in having numerous ovules. I have followed Parlatore, Masters, and others, in placing it in *Taxodieæ*.

Descr.—An evergreen tree, reaching 100 feet in Japan. *Bark* reddish-brown, deciduous in strips. *Branches* subverticillate, spreading horizontally. *Leaves* scale-like, deltoid, caducous, bearing in their axils cladodes or leaf-

like shoots. *Cladodes* in verticils of 20-30, spreading, two to four inches long, linear, rigid, apex obtuse minutely bifid, dark green and shining with a median groove above, paler beneath with a white median furrow. *Male flowers* ovoid, half an inch long, in a terminal compact raceme, about one inch long, subsessile, with a few short membranous bracts. *Stamens* broadly oblong, shortly stipitate, apex acute reflexed. Cells, 2, pendulous, oblong, dehiscing by a vertical slit. *Pollen* globular, minutely tuberculate. *Female* cone terminal, afterwards thrown to one side by the growth a lateral branch, often crowned by sterile cladodes, about three inches long, one and a half inch broad, oblong-ovoid, shortly stalked; peduncle with a few membranous bracts. *Ovuliferous scale* rather large, about three-quarters of an inch wide, longer than and adnate to the subtending bract, orbicular-rhomboid, fleshy, green below, with a brown margin. *Bract* membranous, apex acute reflexed. *Ovules* 6-9, compressed —W. T. T.-D.

Fig. 1, section of leaf, *magnified;* 2, anther front, and 3, back view, *magnified*; 4, bract and ovuliferous scale back, and 5, front view (young); 6, young ovule (*magnified*); 7, bract and ovuliferous scale back, and 8, front view of latter (mature); 9, young seed *magnified*.

M.S. del, J.N. Fitch lith

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Tab. 8051.

PRIMULA Veitchii.

China.

Primulaceæ. Tribe Primuleæ.

Primula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula (§ Aleuritia) **Veitchii**, *Duthie in Gard. Chron.* vol. xxxvii. (1905), i. p. 344, *cum tab. in Suppl.*; ex affinitate *P. cortusoidei*, Linn., a qua habitu robustiore, foliis et floribus majoribus, et foliorum pagina inferiore copiose pubescente differt.

Herba perennis, rhizomate gracili horizontali. *Folia* omnia radicalia, petiolata; lamina 3–4 poll. longa et lata, ovata, cordata, bullata, alte lobata; lobi imbricati, 3–5-dentati, dentibus obtusis vel subacutis, marginibus ciliatis; pagina superior viridis, parce hirsuta, inferior tomento albo subfloccoso indutâ, costâ et nervis primariis crassis valde prominentibus; petiolus laminam subæquans, pilosus. *Scapi* robusti, 9–14 poll. alti, dense puberuli. *Flores* umbellati vel verticillati, roseo-purpurei; pedicelli 9–12 lin. longi, bracteas superantes, puberuli; bracteæ numerosæ, anguste elliptico-lanceolatæ, marginibus ciliatis. *Calyx* 6 lin. longus, brunneo-viridis, extra copiose intra vix pubescens, lobis circa 2 lin. longis, lineari-lanceolatis, marginibus ciliatis. *Corolla* hypocrateriformis, 1 poll. diametro, extra puberula; tubus 4–5 lin. longus, sæpius rubro suffusus, ore flavo annulo aurantiaco conspicue circumcincto, lobis obcordatis ad basim cuneatis. *Filamenta* brevissima, infra dilatata. *Capsula* matura calycem duplo superans.

This is one of the handsomest of the more recently imported Chinese primulas, and will probably prove to be a valuable addition to the list of the cultivated species of this favourite genus. In general habit it approaches *P. cortusoides*, but it is a much more robust plant, and with larger and broader leaves, the under surface of which is densely clothed with whitish floccose tomentum; the flowers also are much larger, and of a deeper rose colour. It was discovered by Mr. E. H. Wilson on the mountains of Western Szechuen, growing on cliffs and exposed spots, at elevations between 8,000 and 10,000 feet. The accompanying plate was prepared from material supplied by Messrs. J. Veitch & Sons, from their Nursery at Coombe Wood.

Descr.—A perennial herb. *Rhizome* slender, horizontal. *Leaves* all radical, petioled; blade three to four inches in length, and as broad as long, ovate, cordate, rugose or subbullate, deeply lobed; lobes imbricate, coarsely 3–5-fid.,

teeth obtuse or subacute, margins ciliate; upper surface green, sparingly pubescent, densely clothed beneath with white floccose tomentum, midrib and primary nerves stout and prominent; petiole nearly as long as the blade, pilose. *Scape* stout, overtopping the leaves, densely puberulous. *Flowers* umbelled, or occasionally in verticils, rose-purple; bracts many, narrowly elliptic-lanceolate, the edges ciliate; pedicels exceeding the bracts, puberulous. *Calyx* half an inch long, brownish green, pubescent outside, sparingly so within, teeth one-third the length of the ovate tube, linear-lanceolate, ciliate. *Corolla* salver-shaped, about one inch in diameter, finely puberulous outside; tube about a third of an inch long, usually tinged with red; mouth yellow, surrounded by an orange-coloured ring; lobes obcordate, cuneate below. *Filaments* very short, dilated at the base. *Capsule* twice as long as the calyx when ripe. —J. F. Duthie.

Fig. 1, portion of under surface of leaf; 2, calyx and pistil; 3, vertical section of ditto; 4, vertical section of corolla:—*all enlarged.*

INDEX

To Vol. I. of the Fourth Series, or Vol. CXXXI. of the whole Work.

8005 Æchmea lavandulacea.
7999 Angelonia integerrima.
8046 Asparagus madagascariensis.
8021 Bowkeria gerrardiana.
8037 Brachyglottis repanda.
8000 Bulbophyllum crenulatum.
8009 Burbidgea schizocheila.
8022 Cacalia tuberosa.
7992 Cadalvena spectabilis.
8007 Catasetum christyanum.
8033 Cirrhopetalum breviscapum.
8040 Colchicum hydrophilum.
8015 ,, libanoticum.
8025 ,, Steveni.
8024 Coleus shirensis.
8010 Cotoneaster rotundifolia.
7993 Cotyledon elegans.
8036 ,, insignis.
8003 Dendrobium regium.
8008 Derris alborubra.
8045 Erica australis.
8018 ,, lusitanica.
8049 Felicia echinata.
8039 Forsythia europæa.
8001 Gnidia polystachya.
8016 Hippophaë rhamnoides.
8029 Impatiens Holstii
(See also under 8046).
8047 Lissochilus Mahoni.
8044 ,, Ugandæ.
8014 Listrostachys bidens.
8026 ,, Monteiræ.
8020 Lycaste Locusta.
8027 Meconopsis integrifolia.
8041 Mormodes buccinator, *var.* aurantiacum.
8017 Nepenthes Rajah.
8006 Nicotiana forgetiana.
8031 Odontoglossum ramulosum.
8023 Pernettya mucronata.
8032 Petasites japonicus.
7994 Phyllostachys nigra.
8011 Pinanga maculata.
8030 Plectranthus crassus.
8043 Primula tangutica.
8051 ,, Veitchii.
8034 Prunus pendula.
8012 ,, Pseudo-cerasus.
8019 Rhabdothamnus Solandri
(See also under 8031).
8013 Rhipsalis dissimilis, *var.* setulosa.
8002 Romneya trichocalyx.
8004 Rosa Hugonis.
8048 Saxifraga apiculata.
8050 Sciadopitys verticillata.
8035 Scilla messeniaca.
8038 Skimmia japonica.
8042 Streptocarpus grandis.
7995 Swainsona maccullochiana.
8028 Tetratheca thymifolia.
7998 Tulipa linifolia.
7996 Vanilla Humblotii.
7997 Yucca guatemalensis.

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Part II., Pages xxv—xxvi, 97—144. Vol. XXXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XXXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XL., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XLI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XLII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XLIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XLIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XLV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XLVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XLVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XLVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XLIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. L., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. LXXXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XC., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XCI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XCII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XCIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XCIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XCV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XCVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XCVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XCVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. XCIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. C., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXXXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXL., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXLI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXLII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXLIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXLIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXLV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXLVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXLVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXLVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXLIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CL., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CLXXXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXC., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXCI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXCII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXCIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXCIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXCV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXCVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXCVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXCVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CXCIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CC., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXXXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXL., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXLI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXLII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXLIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXLIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXLV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXLVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXLVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXLVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXLIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCL., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXXI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXXII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXXIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXXIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXXV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXXVI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXXVII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXXVIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCLXXXIX., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXC., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXCI., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXCII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXCIII., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXCIV., Part I., Pages i—xxiv, 1—96. Part II., Pages xxv—xxvi, 97—144. Vol. CCXCV., Part I., Pages i—xxiv, 1—96. 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Part II., Pages xxv—xxvi, 97—144. Vol. CCCIX., Part I., Pages

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CONTENTS OF No. 3 MAY 1906.

T. [illegible].—PRUNUS PSEUDO-CERASUS.
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.. [illegible].—LISTROSTACHYS BIDENS.
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CONTENTS OF No. 6 JUNE, 1903.

TAB. 8017.—NEPENTHES RAJAH.
„ 8018.—ERICA LUSITANICA.
„ 8019.—RHABDOTHAMNUS SOLANDRI.
„ 8020.—LYCASTE LOCUSTA.
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CONTENTS OF No. 7, JULY, 1906.

Tab. 8022.—CACALIA TUBEROSA.

„ 8023.—PHYSEUTIS MUCRONATA.

„ 8024.—COLEUS SHIRENSIS.

„ 8025.—COLUMNEA STEVENSI.

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CONTENTS OF No. 10, OCTOBER 1905.

Tab. 8037.—BRACHYGLOTTIS REPANDA.

„ 8038.—SKIMMIA JAPONICA.

8039.—FORSYTHIA EUROPÆA.

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„ 8043.—PRIMULA TANGUTICA.

„ 8044.—LISSOCHILUS UGANDÆ.

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„ 8046.—[illegible]

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